MISSOURI BOTANICAL GARDEN

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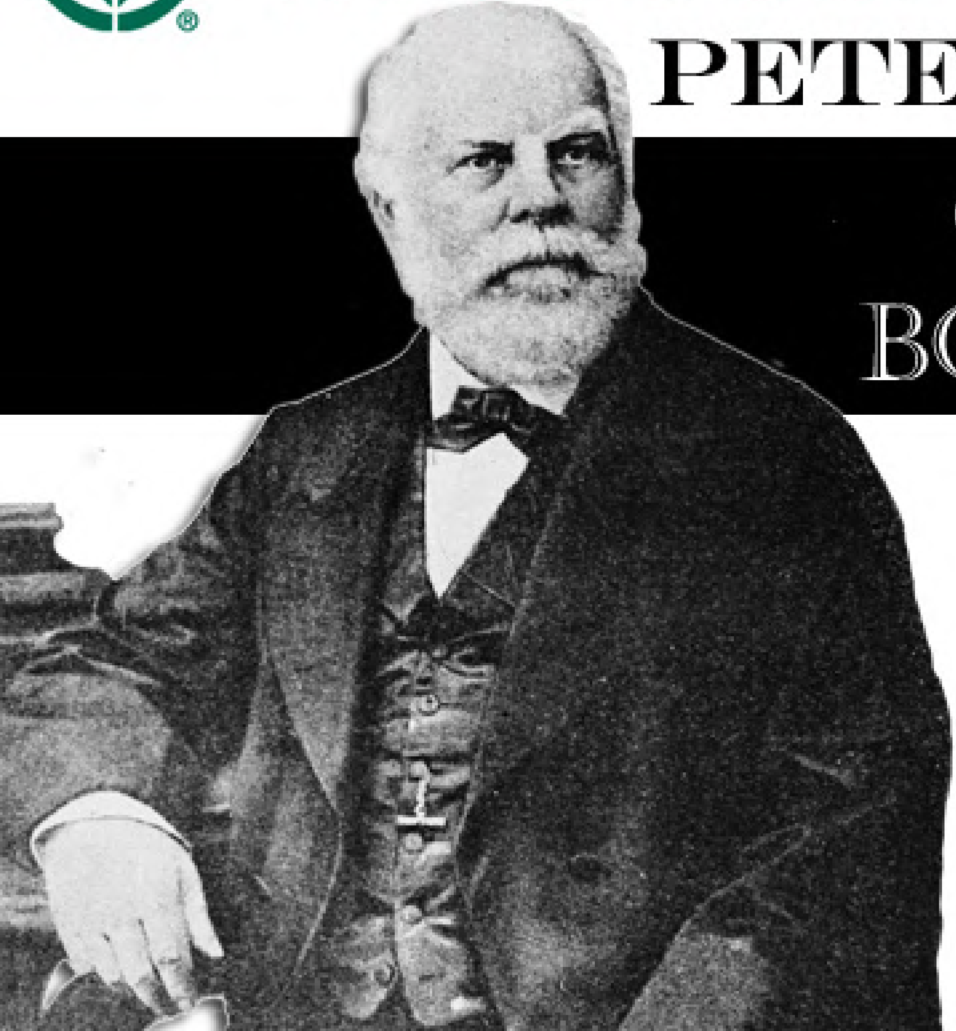
GEORGE ENGELMANN BOTANICAL NOTEBOOKS



Pagination Note:
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Cact 56 | Aug. 1855 221

I have today (Aug 24) examined the seed of a large number of nominal Species of Mamillaria sent by Seeger of Leipzig - They are all very much alike in fact no essential difference between any of them;

fruit (scarlet ?) red clavate elongate. seed 0.4 - 0.6 l. long mostly 0.5; obovate, with a rather acute base; small linear hilum above base. Upper part of seed terete, or compressed testa yellowish or dark brown, almost smooth or mostly more or less distinctly pitted.

1, seeds almost smooth or indistinctly pitted

a, Seeds 0.4 l. long

Mam. purpurascens Ehrenb. ? Salm
M. auricoma Ehrenb = Herrmanni Ehrenb near Senilis

b. Seeds 0.5 l long

M isabellina Ehrenb ?
M splendens Ehrenb = acanthophlegma Lehm
M regia Ehrenb. ?

2 seeds distinctly but finely pitted

M nigra Ehrenb 0,5 near Goodrichii (Salm)
M flava Ehrenb 0.5 - 0.55 = tomentosa Ehrenb
M Linkei Ehrenb 0.5 - 0.55 = Senilis Ehrenb
M. umbrina Ehrenb 0.55 - 0.6 lin near Goodrichii (Salm)

3. seeds a little more coarsely pitted

M euchlora Ehrenb 0.5 l.6 ?
M Tellmanni E ?
M pruinosa E = Seegeri
M Seegeri E near Senilis Lodd fide Salm
M Haseloffii E = Senilis Lodd
M. tomentosa E near lanifera Salm
M. atrosanguinea Ehrenb - coarsest pitted, broadest ?

222 Sept 1855

Cereus pectinatus armatus Poselg.

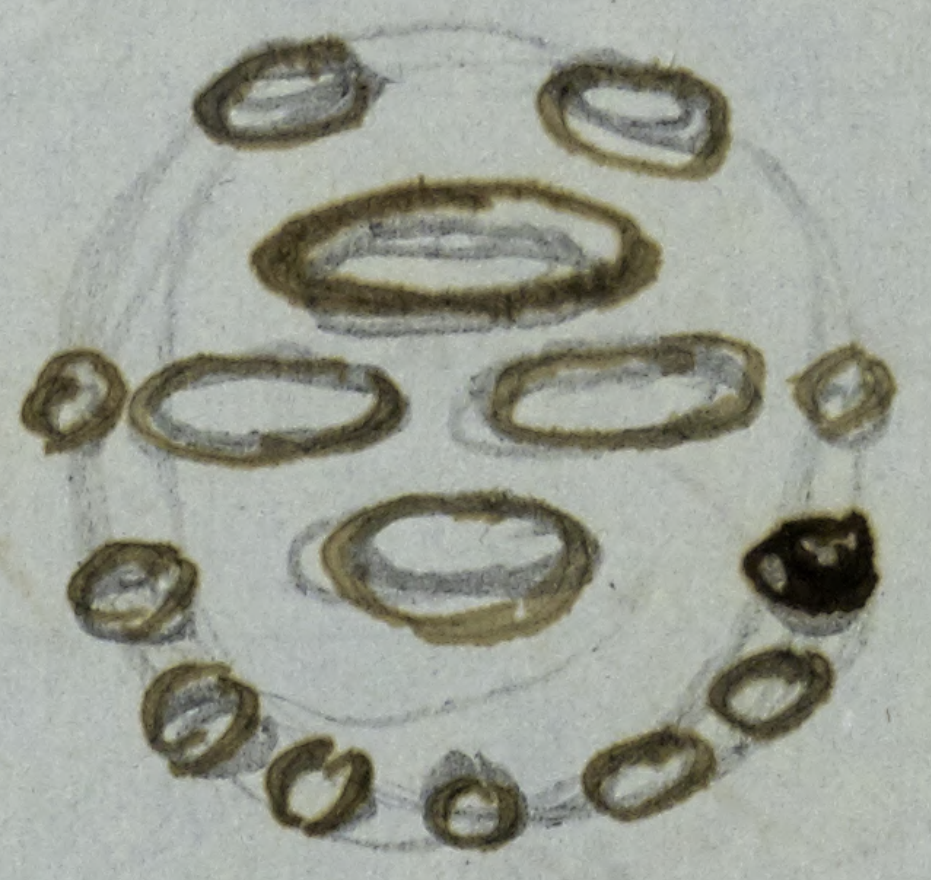
A specimen coll by Dr Poselger at Monterey has 15–16 ribs, is cylindric, about 5 inches high, 1½–1¾ in diameter, areolae crowded, elongated, radial spines 16, but mostly 18–20, 3 to 4 upper ones very short, weak, whitish, 1''', lateral ones longer, lower lateral ones longest, 3'''l., and of a reddish colour, lowest ones shorter again; central spine reddish, compressed at base, 4'''l. lg or shorter, not always present.

He says that there are often 2–4 central spines and sometimes ½–2 inches long! sometimes quite black.

Is this a distinct species or a form of C. caespitosus (C. or pectinatus ?)

see pag 115

Echinocactus horizonthalonius Lem. probably the same as our E. laticostatus. The only essential differences I have tried to state pag 116, but they are hardly enough to constitute a distinct species. The seed and in fact a more careful examination of flower and fruit may prove this to be distinct, but so far I can only consider it a variety of E. h. with broad recurved central spines — : E. horizonthal. γ. laticostatus or perhaps better γ. centrispinus; if it is not identical with β curvispinus Salm



Echinocactus bicolor specimen sent by Dr Poselger from ?

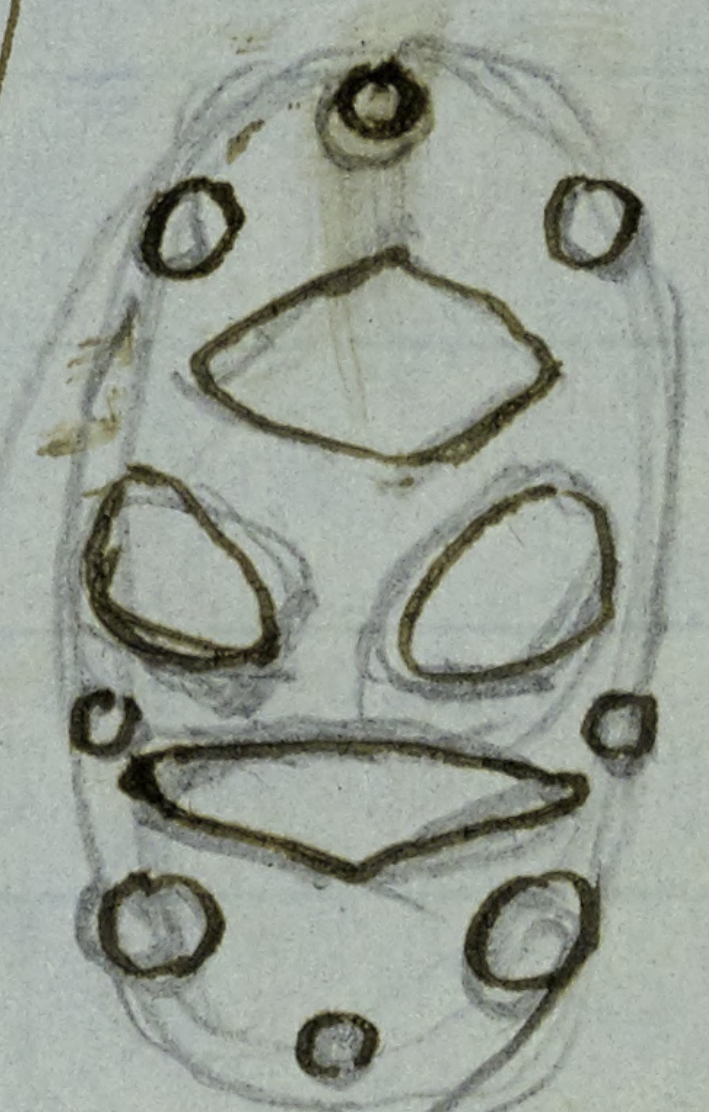
ovate, eight-ribbed, 11 radial & 4 central spines; 9 lower radial sp: red, whitish at upper third, terete 1/2 - 3/4 inch long; lowest one weaker, sometimes entirely white. two upper radial sp. distant from the others, at upper end of areola whitish, flattened; [illegible] 4 central sp: 3 lower ones red & white slightly flattened upper one broader white; all the central spines are directed upwards especially the 3 upper ones and form a fascicle with the 2 upper rad. sp.

Glandular organs betw. floriferous & aculeiferous areola distinct.

E. Pottsii pag 127 is the form with fewer radial spines (9-10), central spines broader and divergent

E. Schottii pag 197 has more radial spines 15-17, upper central spine the longest and carinate at the lower ~~surface~~ side

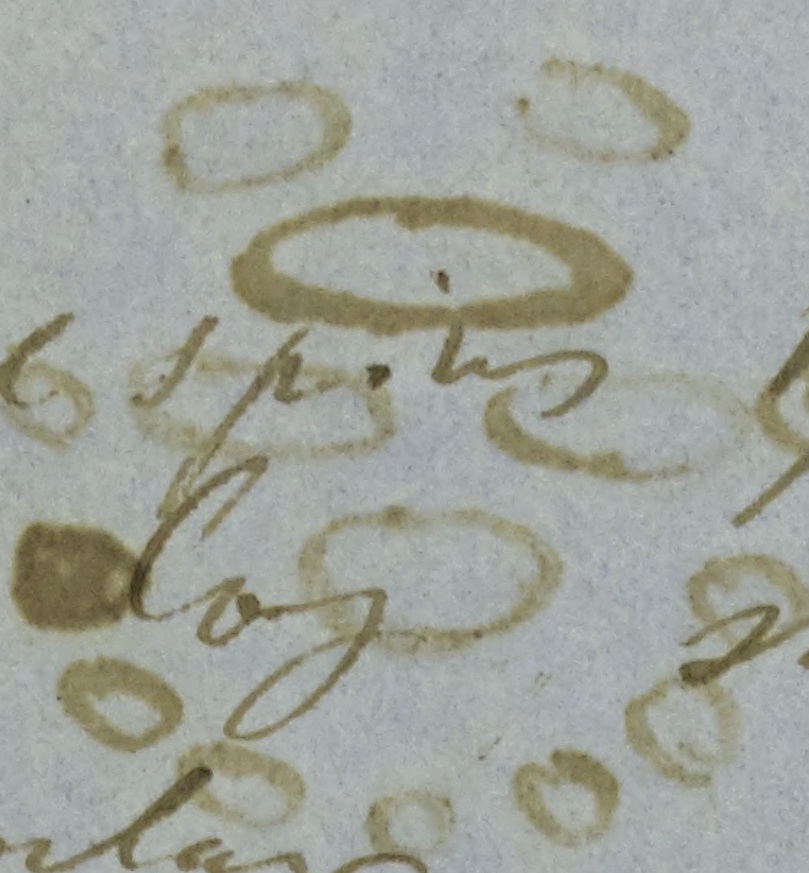
Echinocactus ingens Zucc. Specimen coll by Dr Poselger differs very much from the descriptions in books The arrangement of spines is certainly the simplest type of E. Wisl. & E. LeContei! All three gigantic fellows!



Areola elongated 9 l. long, half as wide, 8 radial subannulate and 4 central strongly annulate spines, 3 radial lower and 3 upper ones and only two small lateral ones, near the lower central one where

but ingens has according to Zuccarini's figure cottony flowers, and therefore belongs to E. texensis! shows how little to rely on analogies offered by the spines!

both others a large number of bristles make their appearance, all 6–9 l. long. 4 central spines, cruciate, upper one 4 angled, slightly curved, longer 2 1/2 inches long; lowest one not quite 2 inches; broad ~~&~~ compressed carinate below; and very slightly curved downward slightly above.



lateral spines 1/4 – 1/2 inch long straight angular

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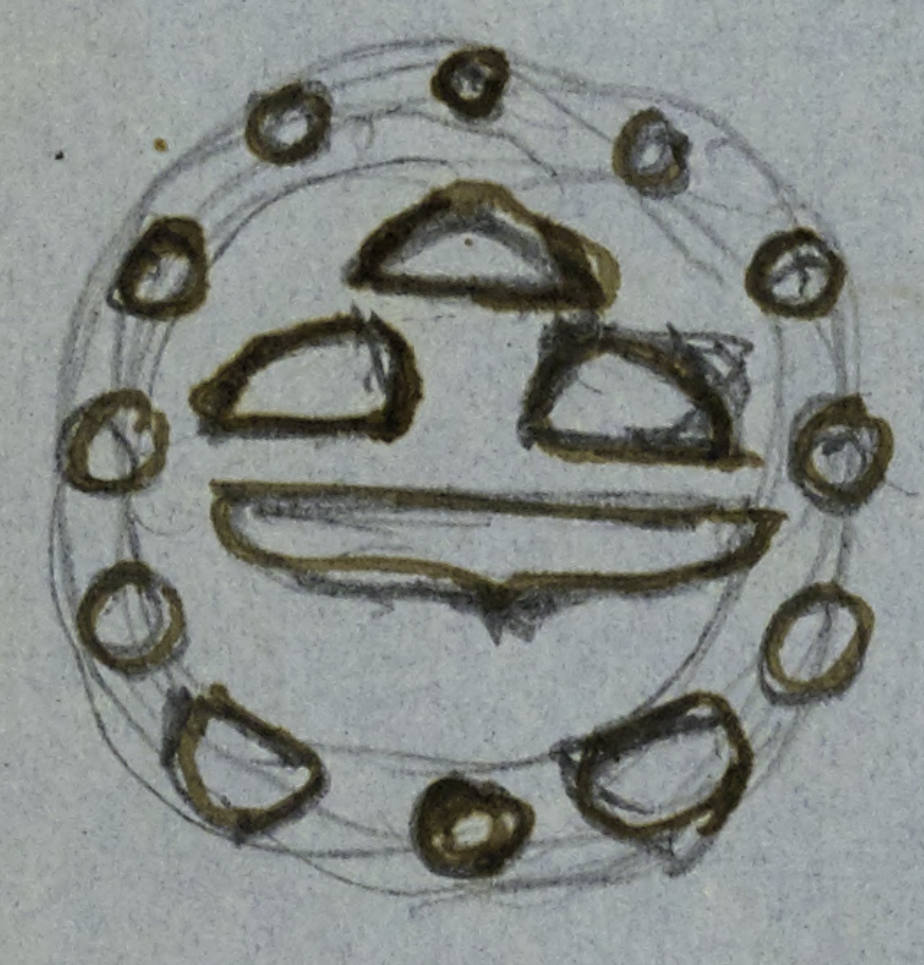
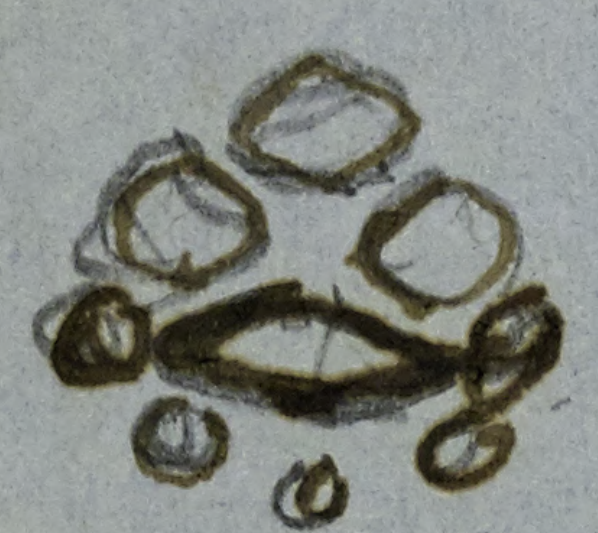
Seed obovate compressed acutish at base, black, shining, one line long; hilum small circular; ~~albu large cotyledons hooked short~~, embryo hooked, cotyledons short half buried in the large albumen

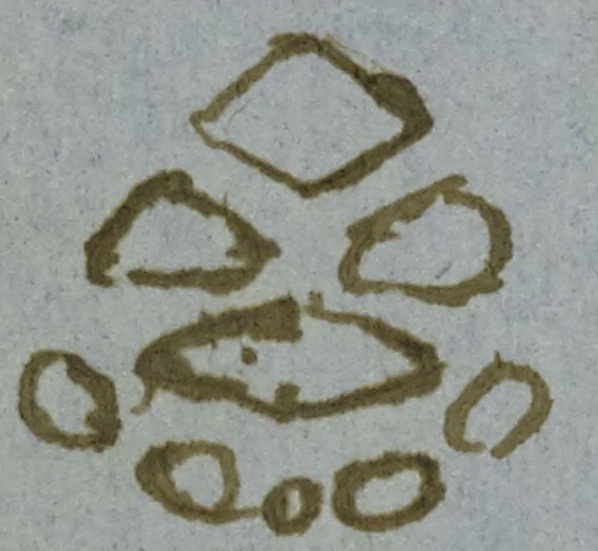
Echinocactus cornigerus DC

Dr Gregg San Louis Potosi

areolis orbiculatis s. basi subcordatis (6–7 l. diamet.) ~~supra~~ in areolam minorem floriferam elongatis; aculeis valde validis rigidis, robustis, ~~rectis~~ annulatis sub 12 & superioribus 3 tenuioribus summo saepe deficiente; lateralibus robustioribus rectis, inferioribus 2 robustis latioribus, applanatis recurvis immo curvato abbreviato [illegible] centralibus 4 & 3 superioribus radiales vix superantib. sursum versis, angulatis ~~radiales vix superantibus~~, imo deorsum flexo latissimo infra obtuse carinato, acute hamato. —







spines of a very young plant

rectis —

more [illegible]

rectis

radial spines 9–12 l. long
central 14–16 l. long; lower central sp. 3–4 l. broad

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Mamillaria Pottsii Salm Specimen sent by Dr Poselger

Poselg. Allg. G. Z. 1853 p. 107
fl large, greenish with red — berries pale rosecoloured

aculeis radialibus 25-30 albidis, inferioribus brevioribus (2-3 l. longis) superioribus longioribus (3-4 l. l.) setis paucis tenuibus, brevioribus mixtis; aculeis centralibus 5-12 s. potius interioribus robustioribus parte superiore, apiceve fuscis, atropurpureisve, inferioribus brevioribus (2-3 l. l.) superioribus 3-6 l. longis in areolis plantarum adultarum 8-10 circulum exteriorem formantibus cum centrali singulo porrecto s. binis.

In the last case the exterior central spines can be considered as an interior radial series.

Tubercles short, oval, only slightly grooved at the apex; axillae naked. — Plant cylindric. old tubercles not apparently hardened and persistent.

Mam Leona Poselg has apparently a good deal of resemblance to M. tuberculosa. has the same woolly axills and a tuft of caespitose reddish spines; is cylindric etc —

Allg. G. Z. 1853 p. 94

But it don't belong to this neighborhood at all; It has 30-40 setaceous short radial spines of equal length, 2-2½ l. long and an inner series of 10 stout somewhat recurved spines the uppermost of which are the longest (5-6 l) the upper one oft becomes central but is always curved upwards.

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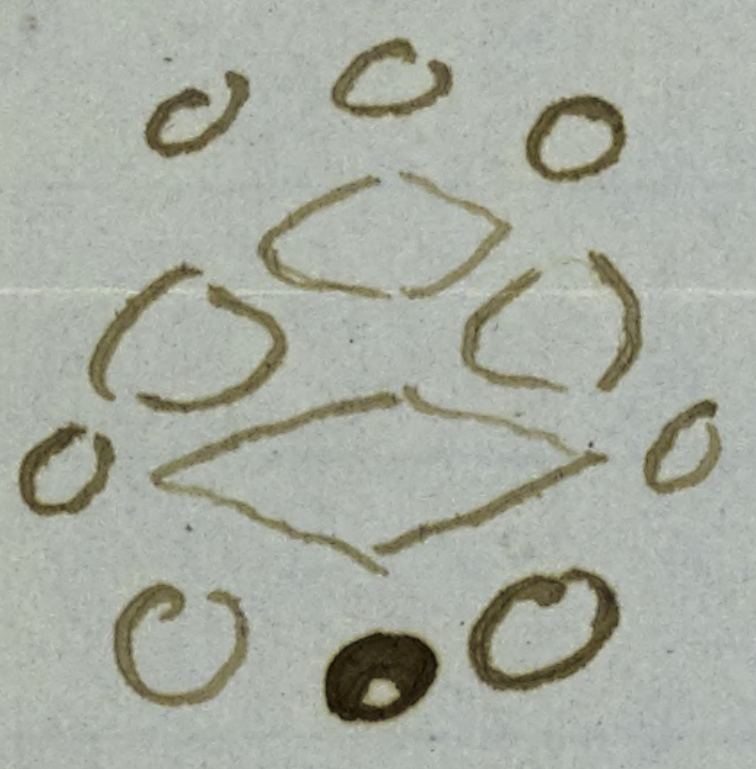
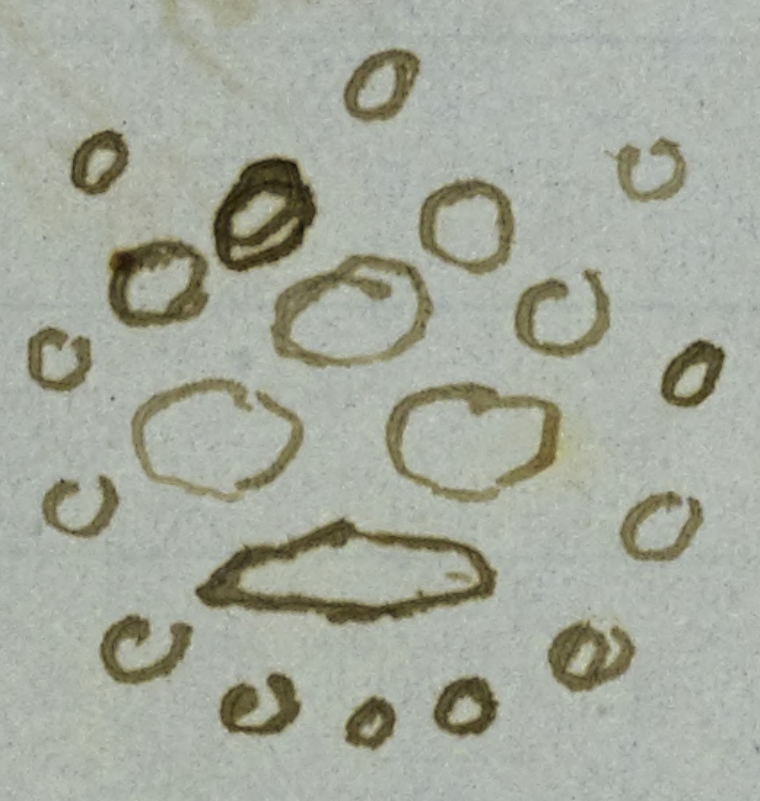
Echinocactus longihamatus Gal is no doubt my E. flexispinus, but I do not know but my name is the older one (1848 Wisl Rep). Still as there is another E. flexispinus Salm though of later publication (1849) and as the name E. longihamatus is now well known and accepted in Europe and very proper, I think it best to adopt it —

E. longehamatus, fruit large, juicy and very acid, Bigelow.

A reexamination of this plant and its relatives shows the characters of distinction

E. longihamatus has 8-12 radial spines, the white or paler lateral ones being sometimes reduced to one pair; but there are always 3 lower and 3 upper ones, and from 1 to 3 pair of lateral ones. Central spines 4; but sometimes as many as 4 additional upper central spines or as Prince Salm expresses it: upper additional radial spines fasciculate. — But these additional spines are stouter red and in every respect similar to the ~~tot~~ upper central spines; — in all 20 spines


E. longihamatus robustus


E. longehamatus gracilispinus

The spines are always ~~smooth~~ glabrous or perhaps sometimes the central spine sometimes scabrous-puberulent.

Flower large, 2½-3½ inches long; stigmata filiform obtuse, 15-18. — lower part of flower tube naked× for 2-3 lines ~~or more~~; fruit insipid or sweetish

× inside of filaments

seed 0.5-0.6 in the shortest and 0.6-0.7 l. in the longest diameter; hilum orbicular- obl. or oblong; testa distinctly pitted.

E. sinuatus Dietr Allg. G. Z. 1851. p. 345
E. setispinus var γ sinuatus Poselger (& var δ robustus?)
= E. Wrightii E pag (86 a) 108. ≠ E.

distinct from the former by the more compressed ribs; radial spines arranged in the same manner, 3 lower & 3 upper coloured spines and from 2 - 3 pair of lateral ones, whitish more slender, and more flexuous, sometimes almost bristle, sometimes hamate; 3 upper central spine straight, coloured or parti- lower one flat, or even channeled, yellowish straw colour, flexuous curved or mostly hooked; all the spines with the exception of the 3 lower radial ones more or less scabrous puberulent, especially when young —

Flowers yellowish with red or greenish yellow externally, yellow inside — petals acutish (or obtusish). Stigmata 8-12 (11 in Wrights spec. 1852, also in „ Conangustrus", 8 in Schotts spec.). distinctly apiculate (especially in Schotts specim) ~~lowest~~ part of tube free.

Fruit (only one before me) green oval small with few (7-10) scales; seeds small in Wrights specim 0.5 l. long & 0.4 wide in Poselgers sinuatus 0.7 l. 0.5 - 0.6 wide in his robustus more elongated 0.6 long 0.4 wide but in all the seed is very finely punctate with small point of needle like dots, hilum oblong or linear oblong. The seed of Poselgers sinuatus is hardly smaller than

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than that of what I take to be the true E. longihamatus; but in all the seed is much more finely pitted and a little more elongated.

The difference of E. setispinus is easy. Ribs in this are more acute, compressed; spines all setaceous, rarely more than one central spine, and that terete, or slightly angular setaceous; — flowers with 5–8 obtuse stigmata; fruit a subglobose red berry, seeds 0.6–0.8 l. long, subglobose obovate, opaque, minutely tuberculated. —

__Echinocactus Treculianus__ Labouret

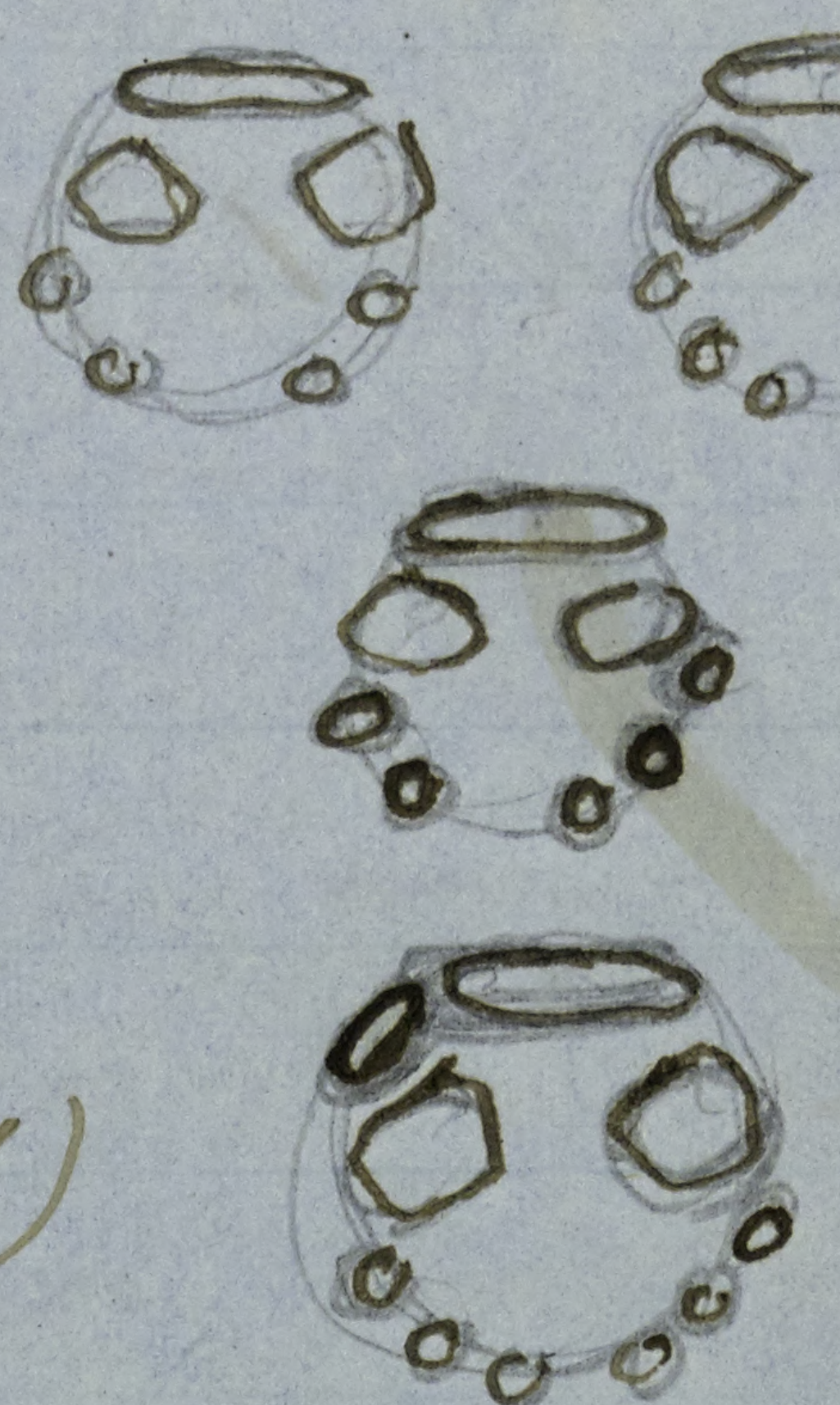
pag 202 belongs either to __E. sinuatus__ or to __E. longehamatus__, perhaps to the former. —

A. G. Z. 1853 p. 119 __E. robustus__ Poselg. is a variety with all 4 central spines and often also the 3 lower radial ones more or less hooked. — I have not seen the plant, but the seed seems to refer it to E. sinuatus, of which it may form a variety.

A G. Z. 1853 p. 118 __E. setispinus β. tenuis__ Pos. is a form with 12–20 radial spines 3–4 lin long, and 1 centre 6–8 l. long, hardly hooked. similar apparently to my β. setaceus.

Echinocactus grandicornis Lem. var

Depresso-globosus, umbilicatus vertice tomentoso, costis (in sicco) maxime undulatis compressis, acutis, sub 36 areolis distantibus, junioribus longe fulvo lanatis ~~tomentosissimis~~, aculeis 3 (raro 4) superioribus longioribus robustioribus (summo latissimo complanato lateralibus angulatis) rubro-fuscis, ultra pollicaribus; inferioribus 4-6 radiantibus brevibus albidis (vix semipollicaribus) translucentibus omnibus rectiusculis.



Specimen before me 3 inches diameter coll by Dr Gregg north of San Louis Potosi Upper spine 10-15 l. long, upper one 1-2 l. wide, lower spine transparent 4-6 l. long —

A very characteristic species of § Stenogoni; belonging to the first section without central spine; — of which Salm describes only 3 — E. Hookeri has only 2 very small lower spines; E. phyllacanthus has the 2 upper lateral spines by far smaller; and the common form of E. grandicornis has the upper spines larger and the lower smaller than in this form.

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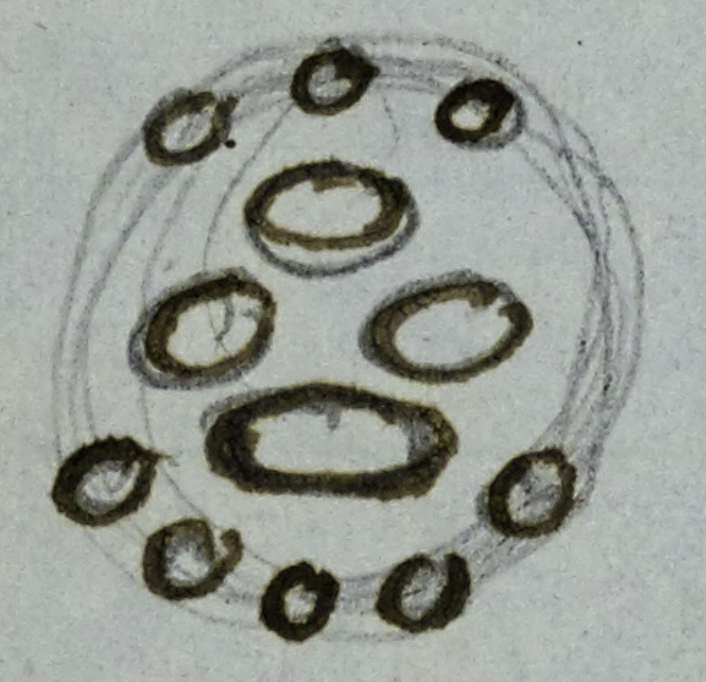
Notes on Berlandiers

Cactaceae

No 1. pl. 6. Echinocactus texensis flower & fruit
fruit a globose red very fleshy berry, abt
10 l. in diameter, setaceous or subulate
~~sepals~~ ~~with~~ little bunches of wool in
the axills, while the ovary is thickly
covered.

"Melocactus laciniata Berl Mss"
"Melocactus Bisnaga Berl. Mss"

Echinocactus uncinatus ~~Hopf~~ aculeis 7–8
radialibus 3 inferioribus hamatis purpurascentibus, 2 lateralibus albidis rectis
2–3 superioribus tenuioribus rectis
purpurascentibus variegatisve; centralibus
4, 3 superioribus sursum versis, infimo
elongato flexuoso hamato;
flore tubuloso, limbo ~~dilatato~~ ~~aperto~~,
sepalis ovarii tubique 36 ovato-cordatis, cuspidatis mucronatis, late
albo-marginatis ciliolatis; sepalis
superioribus 14 oblanceolatis aristatis,
~~late~~ marginatis; petalis 25
lineari lanceolatis acuminatis aristatis
stigmatibus 8–10 crassiusculis
Bacca — seminibus
curvatis cochleatis, valde compressis
laevibus lucidis ~~hilo~~ circulari



Dr Poselgers spines

Dr Greggs flower

Dr Poselgers seeds

The spine I have described
has been sent by Dr Poselger.
3 lower spines hooked smooth,
all the others are slightly asperate
-pubescent. Three lower rad. sp.
1–1 1/2 inch long, middle one the

shortest, 2 lateral sp. ~~ov~~ one inch or over
2-3 upper ones weaker but hardly shorter.
3 upper central sp. straight 1½ inch long
slightly compressed, dark at tip; lower
central sp 2-3 inches long, compressed hooked.

Flowers coll by Dr Gregg south of San Louis Potosi
1¾ inch long 1 inch wide — with a long
tube. — I am not certain whether
this flower belongs here, as I have
no spines — but strongly suspect it
on account of its close resemblance to
the fl of the northern plant; from which
it is distinguished by the longer
tube and the acuminate aristate petals. —

Seed sent by Dr Poselger is
somewhat similar to that of the northern
plant, but more compressed, and
quite smooth. 0.6-0.7 l. long; albumen
quite large, embryo curved, cotyledons very distinct
parallel

Cereus tuberosus Poselg. Allg. G. Z. 1853 p. 135

C radice tuberosa ~~erectus~~, tenuissimus, teres
lignosus, ~~sursum versus~~ sensim incrassatus,
cylindricus, demum articulatus, parceque
ramosus debilis sub~~s. sub~~scandens s. reclinatus erectus, costis 8 parum elevatis,
areolis parvis confertis ~~approximatis~~ junioribus parce
flavo tomentosis, aculeis 9-12 rectis radiantibus adpressis
~~tenuibus~~ subulatis ~~rigidis~~ parvulis albidis
superioribus paulo longioribus, centrali singulo longiore
e basi crassa subulato, arcte sursum
adpresso toto s. versus apicem fusco.
floris sub terminalis tubo brevi ~~pr~~ pulvillis squamatis
albolanatis ~~seto~~sque aculeolatis stipato, sepalis superioribus

8 lineari lanceolatis; petalis 16^d lanceolatis acuminato-aristatis. ~~purpureis~~ [illegible] filamentis abbreviatis, stylo elongato stigmatibus 8 viridibus; ~~bacca~~ sicca villosa setosaque; seminibus perigonio coronatis minutis obliquè obovatis compressis, ~~rugosis exsculptis~~, dorso carinatis ~~[illegible]~~, hilo oblongo

petalis

rugosis ex
+ ~~tuberculis concatenatis~~
~~confluentibus [illegible]~~

Dr Poselger discovered this species on "the Texan side of the ~~[illegible]~~ Rio Grande" Mr A Schott found it near Mier and on the Charco hills 3 miles below Laredo on arid rocky ridges always among shrubs, which support its ~~weak~~ and otherwise rather reclining ~~decumbent~~ stem." whence he gave it the name of C. geniculatus. — Tuberous root 3/4 to 1 1/2 inches in diameter; Stem 1–2 feet high ~~lower part of~~ ~~stem~~ hardly as thick as a quill, terete and ligneous, upper, younger part and branches ~~[illegible]~~ 3/8 to ~~[illegible]~~ in diameter, younger branches clavate; ~~Ribs very little~~ prominent; — areolae 1 or 2 lines distant, small; radial spines 1 line long or less; central spine 2–3 lines long, in weak specimens whitish, or black only at tip in ~~older ones~~ more robust ones upper half or the entire spine brown or black; rigidly appressed and generally reaching to the 2 areola above.

4 to 8 lines

Flower [described from ~~after~~ a specimen ~~raised from~~ by him seeds by Dr Poselger] exactly terminal, so that the ~~stem~~ ovary is a complete continuation of the stem; — this is a very singular occurrence — but Mr Schott also describes the flowers as occurring at the end of the branches.

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Cact 59 | Sept 1855 233

If Dr Poselger has seen right, the branch
or stem bearing the terminal flower
was no doubt of the growth of the year before.
Flowers open ~~fully~~ for several days, only in bright sunshine,
over 2 inches long and of the same diameter;
tube 1 inch long; covered with very woolly pulvilli
which in the axills of reddish appressed scales
bear 6 or 8 long white or black bristles;
upper sepals brownish or purplish;
petals paler or darker purple, with
a deeper tinge in the center, about 1 inch long
Fruit covered with long wool and
black and white bristles, resembling
very much the fruit of C. caespitosus.
Seed only 0.4 l. long, rugose, with confluent tubercles
which form pits; a common case among Echinocerei, which
leaves us frequently in doubt, whether to describe the seed as
pitted or tuberculated! — Album. none, embryo almost straight, with
short transverse cotyled.

The flower and fruit identify this
species with the Echinocerei — furnishing
another proof that the external
shape, striking and distinct as
it may be can not ~~give~~ furnish proper
means of classification in Cacti,
though no doubt it forms valuable, but mostly
secondary characters. Cereus Berlandieri
and C. procumbens ~~furnish~~
connect the true Echinocerei with
this singular form.

Cereus gonacanthus Engel. & Bigel.

ovatus simplex s. e basi parce ramosus,
costis 7 ~~tuberculatis~~ interruptis, areolis magnis
orbiculatis distantibus, aculeis robustis
angulatis rectis s. varie curvatis
flexuosis ve[illegible], ~~demum cinereis~~ radialibus 8; ~~infimo~~
~~breviore debiliore~~, ~~summo robustissimo~~
~~longiore~~ ~~obscuro~~, ~~multangulato~~, ~~obscuro~~
~~aculeum centralem~~ sub ~~aequanto s. eo~~
~~longiore for~~ ~~s. infero~~
~~infimo breviore debili~~)
* inferioribus lateralibusque) quadran-
gulatis flavidis ~~basi~~ et saepe
apice obscuris, infimo breviore
summo elongato robustiore ~~[illegible]~~ multangulo, obscuro ~~aculeum~~
nigricante erecto aculeum centralem similem ~~longiorem~~, ~~multangulo~~
~~lateralem~~ erecto patentem ~~nigricantem~~ s. subaequante,
s. ~~subinde~~ saepius excedente.

On high Sand bluffs, ~~covered~~
with scattering Cedartrees, near the
natural well about 40 miles
east of Zuni. Only seen in
that locality, no fruit found.
This species resembles in its growth
Cereus triglochidiatus, + it is simple
or has only ~~few~~ (2 or 3
heads ~~branches~~). The ~~young~~ areolae
are tomentose ~~and~~ 3-4 lines in diameter
and 6-10 l. distant from one another.
The lower radial spine is 8-12,
the others 10-15 l. long, pale
or dirty yellow, when young; ~~ashy~~
~~gray when old~~. The upper radial
spine is stouter and longer than
the others and resembles ~~the central~~
spine in shape size and colour;

+ I have therefore placed
it, doubtfully (because the
flowers are unknown),
between this species and
C. Bigelovii to which it apparently
by the upper radial sp. being the largest
and in the angularity of the
spines

We find it in the few specimens at our disposal from 1¼ to 2½ inch long; sometimes it even assumes a more central space in the areola, the two upper lateral spines almost closing above it; very rarely a small tenth spine appears above it. The central spine is 1½–2½ inches long, 1 lin. in diameter, and deeply furrowed, about 7 angled, somewhat longer, or equal or rarely shorter than the upper radial spine. ~~These are~~ Both these spines are almost black or mottled yellowish and black when young but become gray like all the others when old. Fl. & fr. unknown.

~~It is p~~ ~~paucispinus β. tenuior~~ hexaedrus

Cereus ~~oligacanthus~~ Engelm. & Bigel.

ovatus simplex s. e basi parce ramosus, costis 6 subinterruptis obtusis, ~~6-costatus~~, sulcis latis superficialibus, areolis ~~distantibus~~ ~~ab~~ ovalatis minoribus distantibus; aculeis (rectis rigidis) tenuioribus subangulatis basi bulbosis; radialibus 5–7, e flavido rubellis, inferiore breviore, summo ~~saepe~~ robustiore; centrali ~~[illegible]~~ simili paulo robustiore longiore, jam ore fuscato, saepe deficiente

Under Cedars in sandy soil ~~about~~ 15 miles west of Zuni. Few heads 4 to 6 inches high 2 to 2½ in diameter with 6 obtuse ribs separated by wide and shallow grooves, ~~Areolae~~ areolae tomentose when young 1½ lin. in diam., 6 or 8 lines distant. Spines slender, but stiff, quite bulbous at base, lower ones 6–10, upper ones 8–15 l. long; mostly 6 radial spines present, the uppermost being ~~they~~ four the longest most robust and darkest, ~~when no~~ in the absence of a central spine ~~is present~~ but smaller where that ~~one~~ is ~~appears~~ present; in a single instance I have observed 7 radial ~~spines~~ and in another 2 flattened central spines.

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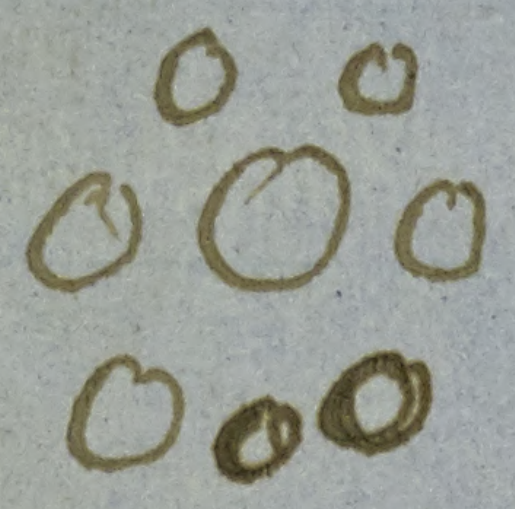
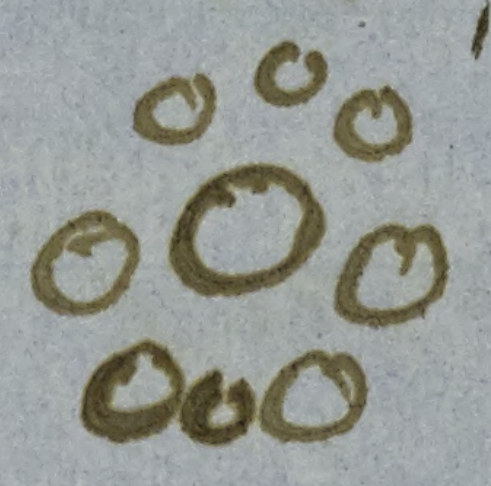
Central spines 12–15 l. long. —
Shape of plant similar to C. triglochidiatus & C. paucispinus to both of which it is very nearly allied. It appears to bear the same resemblance to C. phoeniceus that the latter does to C. polyacanthus

~~This may be a form of C. Fendleri see pag 242~~

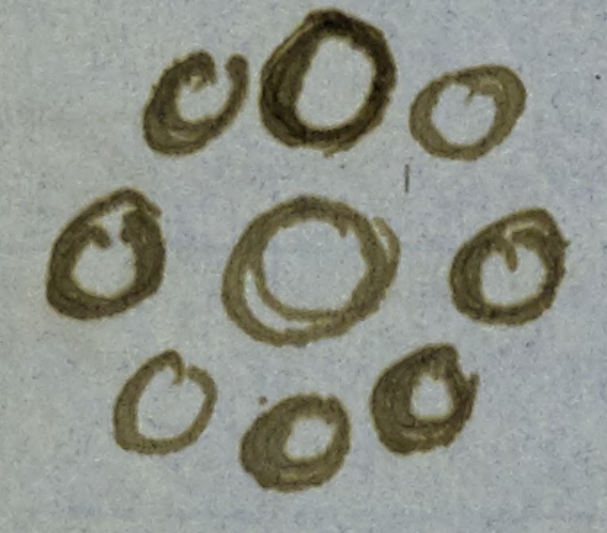
Cereus Bigelovii Engelm

ovatus dense caespitosus glaucescens ~~10-11~~ costatus, areolis ~~magnis~~ orbiculatis magnis, junioribus dense albo-tomentosis, ~~distantibus~~ remotis; aculeis ~~sub~~ ~~elongatis~~ robustis (elongatis curvatis) teretiusculis s. ~~subangulatis~~ (basi bulbosis) radialibus 7–8, infimis superioribusque debilioribus, lateralibus longioribus centrali singulo angulato sursum incurvato.





~~Cer.~~ β? zuniensis dense caespitosus 10-costatus, areolis paulo minoribus ~~magis approximatis~~ aculeis paulo tenuioribus, quadrangulatis basi bulbosis, ~~radialibus 8~~ rectis s. paulo curvatis flexuosisve; radialibus 8 infimo graciliore, summo robustiore longioreque, centrali singulo robustiore longiore recto s. sursum incurvo.



Found ~~at~~ near the Mohave River 20 miles west of the Rio Colorado with Echin. Engelmanni etc; the oval heads 2–3 inches high and 1½–2 in diam. form a dense caespitose mass, much like C. phoeniceus; the areolae are 3 l. in diam. 6 lines or more distant from one another

Cact. 60 | Sept 1855

The long and very bulbous spines are much curved and interlock almost hiding the body of the plant. Upper and lower radial spines 9-15 l. ~~long~~, uppermost one wanting or weaker than the rest lateral ones 15-25 l. long; ashy red when young; central spine more angled, 1½-2½ inches long; dusky, all ashy gray when old. see pag. 244

Var? β. zuniensis was found much farther east, near Cañon Diablo on the Colorado Chiquito, about 120 miles west of Zuni. Its growth and whole appearance is similar to the plant from the Mohave, the spines ~~however~~ are weaker, straighter, and more angular; the principal difference consists in the strong upper radial spine, which ~~seems to~~ comes nearer the central in size (similar to C. gonacanthus from the same region — a much stouter plant, ~~with~~ much stouter spines) Young areolae nearly 3 l. in diameter, 4-6 lines distant; lowest rad. sp. 6-9 l. lateral ones 9-15 and upper one 12-18 l. long; ~~Central~~ spine 1½-2 inches long, very bulbous at base. Young spines straw coloured, older ones ashy. Flower & fruit of both ~~plants~~ are unknown ~~they may possibly when known~~ oblige us to separate these ~~species~~ forms specifically.

intermediate between Mohave & gonacanthus

Cereus conoideus Engelm. & Big.

Ovatus versus apicem conoideo-acutatus, parce e basi ramosus. costis 9-11 tuberculatis, areolis ovato-orbiculatis, orbiculatisve junioribus albotomentosis; aculeis basi bulbosis radialibus 10-12 tenuibus rigidis rectiusculis summis brevibus, lateralibus inferioribusque longioribus; — centralibus 4 (raro 3-5), ~~plerumque 4~~ ~~paulo robustioribus~~ superioribus radiales vix superantibus infimo multo longiore 4angulato saepe compresso porrecto s: deflexo.

On Rocky & mountainous ~~places~~ localities on the Pecos; in September without fl. & fruit. — Heads 3-4 inches high, single or few of unequal hight together, not forming such dense ~~hemi~~ spherical masses as C. phoeniceus and others, remarkable on account of their conical or acutish shape, uniformly observed whence the name. — Areolae 4-6 l. distant; spines white or straw colored, larger central ones often dusky when young; radial spines slightly bulbous at base, ~~central ones much more~~ upper ones 2-5 l. long, lateral ones 6-15 l. long, lower ones hardly a little shorter; central spines very bulbous, upper ones not much longer than the radial spines, lower one sharply quadrangular usually compressed, often deflexed, and curved, 1-3 inches long.#

Perhaps C. Roemeri Mühlenpf. from the San Saba

The arrangement of the spines brings this form very near

On the San Francisco Mountains a specimen was collected with 11 ribs, 8-9 radial spines 4-12 l. long, the uppermost shortest, and 3-4 central spines, reddish gray, very bulbous at base, the lowest longest ~~and~~ and angular, (12-20 l. long). This, though in appearance resembling C. Bigelovii must be referred here and seems to indicate that this species ranges from ~~the~~ the 105-112 deg. Longitude

The Mexican C. acifer, Otto, which however is a higher plant, & has a much stouter central spine. — C. Roemeri Muhlenpf. Allg. G. Z. 1848 p. 17 — from the San Saba must belong either here or to C. phoeniceus or connect them. The description leaves me little doubt that it must be referred here.

A species from Anton Chico seems to unite C. con. with C. phoeniceus — areolae more distant than in the latter; spines longer, central sp. 3, lower one somewhat curved, and angular!

Cereus phoeniceus (C. coccineus E. not Salm or DC.)

see pag. 36 & 73 ovatus s. ovato-globosus obtusus apice sphaeroideus, ~~[illegible]~~ caespitosus, costis 9–11 tuberculosis ~~interruptis~~, repandis, areolis ovato orbiculatis orbiculatisve junioribus albotomentosis subinfertis ~~approximatis~~; aculeis setaceis rectis, radialibus basi vix bulbosis, sub 10 (8–12) albidis superioribus paullo brevioribus; centralibus 1–3 ~~robustioribus~~ basi bulbosis, inferiore paulo robustiore, albidis s. basi fuscescentis ~~teretibus rariis subangulato~~

fl. see pag. 36. — fr. ?

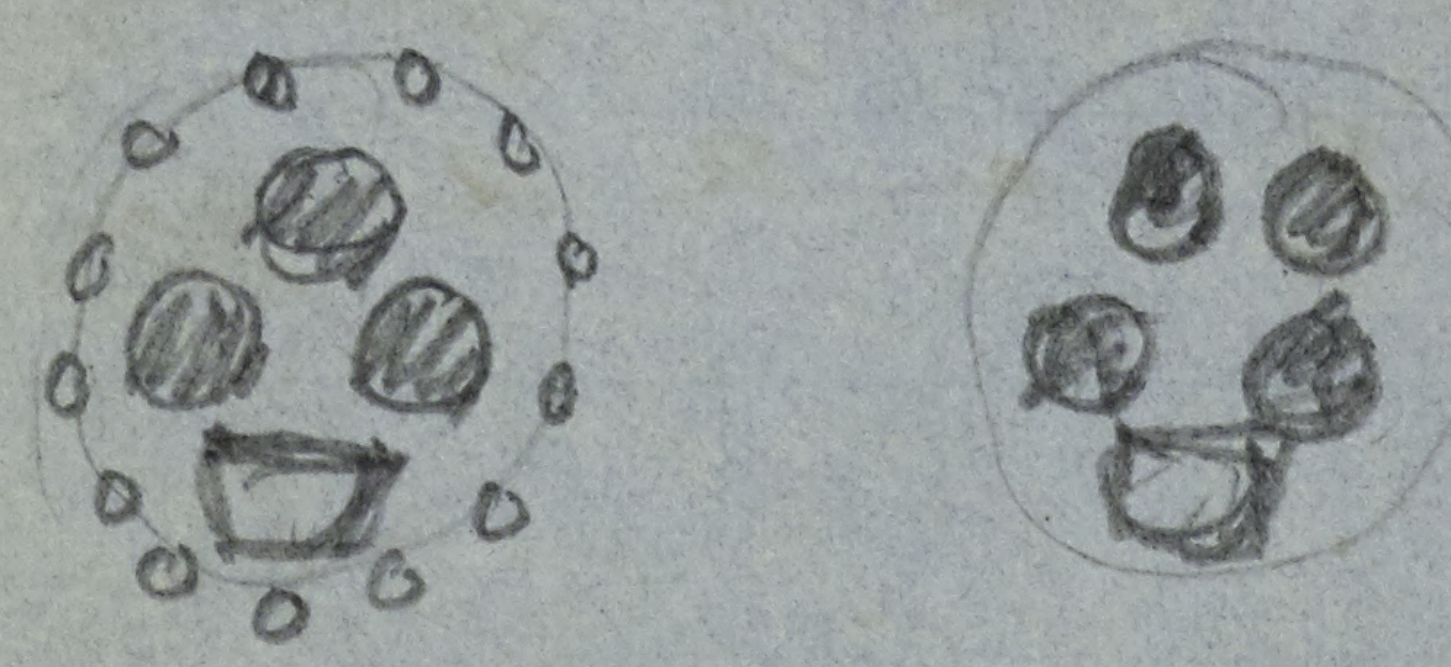
~~Alb~~ Albuquerque and Santa Fe from the upper Pecos to, also on the San Francisco Mountains fl. The heads are from 2–3 inches high, about 2 inches in diameter and rounded; they generally form dense caespitose masses often of a foot or more in diameter. Areolae somewhat oval or almost orbicular, 3–4 l. distant, large. Spines slender, radial ones 3–6, central ones 5–10 l. long;

Distinct from C. conoideus by the caespitose growth, the rounded heads, the shorter & more slender spines, fewer and ~~terete~~ straight central spines

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

3547

variegatus ovato cylindricus
Cereus ~~poecilocentrus~~ simplex s.
parce e basi ramosus, 12 costatus,
areolis orbiculatis approximatis; aculeis
exterioribus sub 13 ~~radiantibus~~ gracilibus ~~tenuibus~~ rigidis & adpresse
radiantibus, albis apice sphacelatis
lateralibus longioribus summis deficientibus
aculeis centralibus sub 4 ~~1-4~~ (multiplices in junioribus), infimo
~~longiore~~ angulato albo decurvo
ceteris brevioribus teretiusculis nigris
corneisque variegatis; floribus ~~ex~~
inferiore plantae parte; ~~fructu~~
bacca ovata, pulvillis ~~numerosis~~
setas tenues numerosas albidas gerentibus
stipata; seminibus obovato-
subglobosis (depressis) ~~rugoso~~-tuberculatis, opacis



On the Cactus Mountains and at ~~H~~ the ~~valley~~ head of Bill Williams
4
Fork. Stems simple or with few
- not more than 3-5 - branches;
~~head~~ 4-9 inches high; areolae 2-4
lines distant. Radial spines 3-5 l. long;
upper central spines 3 ~~or sometimes~~
4 are black on the upper side and
horncoloured on the lower side and
~~at~~ towards the point, 1-1½ inch long;
lower white spine ½-2 inches long;
Fruit on the lower half of plant is
much like that of C. chloranthus;
only 6 or 8 l. long, crowned with the
remains of the (red?) flower.
Seed 0.6-0.7 l. long, compressed ~~tuberculated~~
sometimes irregularly ~~[illegible]~~ confluent, and ~~often~~ leaving
pits between ~~these~~ the ridges; ~~lower~~ part of
back with a smooth carina;
hilum oval.

0 1 2 3 4 5 6 7 8 9 10
cm
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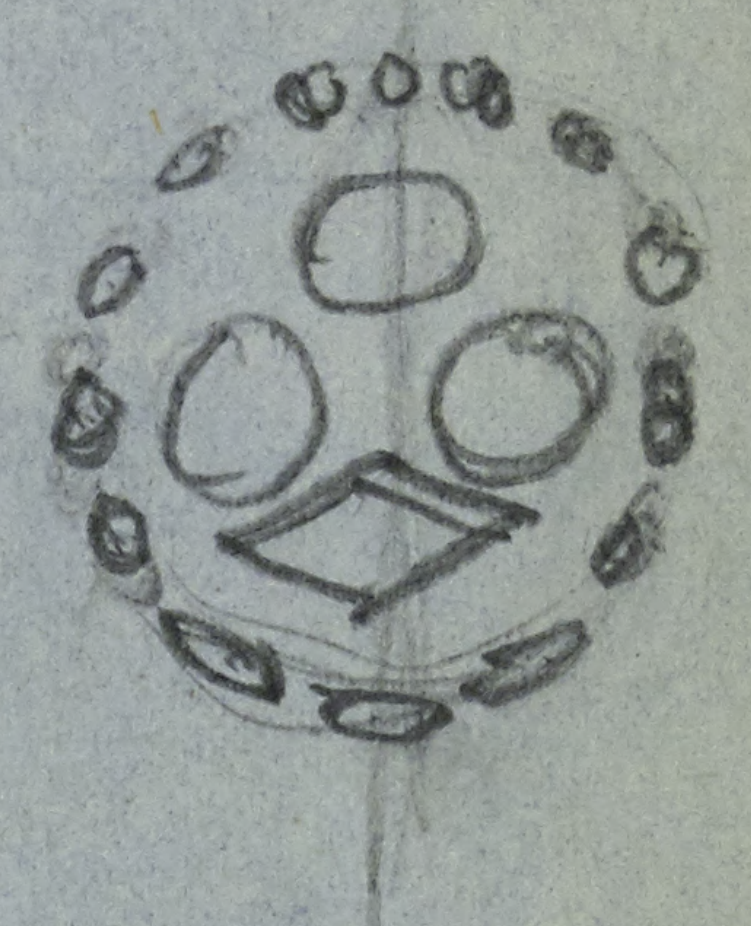
MISSOURI BOTANICAL GARDEN

Cereus chryso ~~xanthocentrus~~ cylindricus parce e basi ramosus, 10-12 costatus, areolis magnis distantibus; aculeis radialibus 12-14 albis superioribus setaceis brevibus, inferioribus longioribus robustioribus angulatis compressis rectis s. paulo incurvis; centralibus sub-4 superioribus rigidis robustis basi bulbosis angulatisque rectissimis longioribus, ~~vitellinis~~; inferiore angulato compresso albo recto paulo breviore, deflexo floribus ex superiore plantae parte, bacca ovata, pulvillis paucis ~~spiculeos~~ setosos (albos) elongatos gerentibus stipata



On Bill Williams Fork and from there to the west of the Colorado and up the Mohave almost to the Sierra Nevada.

— Stems few together 5-10 inches high, young areolae 2½-3 l. in diam., 6-7 l. distant; upper rad. sp. 3-5, lateral 5-7

An interesting ~~species~~, ~~well disting.~~ easily recognized by the ~~long~~ stout and rigid deep yellow spines, which on top of the plant are erect, —

lower 7-12 l. long; the latter flattened and often curved up, from the plant. Upper central spines 3 or sometimes 4, 2-3 inches long, bulbous and angular at base, terete above, deep yellow; Lower central sp. 1½-2½ inch long, flattened. Spines on fruit 3-8 l. long, fewer and stouter than in the last species, to which it bears a great resemblance, but seems distinguished by the stouter, straighter, less divergent central spines, the flattened lower radial spines and the fruit.

242

pg. 94

Both are near C. Engelmannii Parry from San Felipe, a few degrees south of the ~~localit~~ head of the Mohave. But seem to differ by # ~~bearing~~ forth flowers & fruits on the lower part of the stem, ~~and~~ very similar.

the colour of the spines and principally by

Cereus Fendleri ovatus s. ovato-cylindricus, simplex s. parce ramosus, costis 9-12 rectis s. obliquis tuberculato-interruptis, areolis orbiculatis junioribus albo tomentosis sub~~approximatis~~ confertis, aculeis basi bulbosis radialibus (rectis s. saepe curvatis) 7-10, inferioribus robustioribus, infimoque 4-angulato albido, sequentibus 2 obscuris, ceteris albidis s. saepius fusco-variegatis ~~superioribus~~ tenuioribus brevioribus pallidis, summo deficiente s. ~~robusto~~, ~~curvato~~ elongato curvato fuscato; aculeo centrali (elongato, teretiusculo) valde bulboso, ~~sursum deflexo~~ ~~fusco curvato~~ fusco-atro fl ex ~~axillis~~ superioribus — see pg 95

perviridi

bacca globoso-~~ovata~~ ex viridi-purpurascente, pulvillis aculeiferis 18-20 stipata, seminibus oblique obovatis paulo compressis, ~~orbiculatis~~ tuberculatis opacis hilo ovato-orbiculato.

curvatis

In various situations, among rocks or in alluvial river bottoms from Santa Fe to the Cañon of the Rio Grande below El Paso, and from the country 50 miles east of the Pecos westwardly ~~to Zuni~~ to the Copper mines ~~and~~ to ~~Bill Williams~~ the Aztec Mountains near the Rio Colorado.

Fl. in May & June

Stems simple or few together 3–8 inches high, 2–3 in diameter; not many together and usually of unequal hight not level topped like C. coccineus and others. Areolae 4–~~7~~ l. distant. Spines very variable, characterized by their bulbous base ~~and~~ by the lower ones being ~~stouter~~ and longer ~~than~~ the upper ones, partly white and partly dark by ~~and~~ the long ~~curved~~ dark coloured central spine. ~~In a few individuals~~ ~~I find only~~ Radial spines mostly 7, a whitish angular one 6–12 l. long below, 2 more terete ones, black on the upper and usually whitish at the lower surface, of the same length or even a little longer next ~~of nearly same length~~ mostly shorter, hardly the 2 white or rarely variegated ones on the side of the central spine and above that 2 weaker and shorter white spines, ~~about~~ 3–6 or 7 l. long.

~~But not often~~ This is the usual form, especially in the north, but often 2 more upper spines appear, and sometimes a ~~very~~ slender, and oftener a ~~very~~ stout and dark coloured ~~uppermost~~ spine sometimes as much as 15 l. long ~~makes its appearance~~ is situated on the upper edge of the areola, similar to but always ~~sm~~ smaller than the central spine. 6–15 l. lg. All these forms are occasionally seen on the same specimen. In some southern specimens I see sometimes ~~occasionally~~ a few smaller additional upper spines. In the form which I have in Pl. Fendl. p. 51 described as β. pauperculus and which has also been collected on the Pecos by Dr Bigelow, ~~I see only~~ mostly 6 spines, the ~~upper radial spines are~~ 5 lower and lateral radial sp. and the central one which assumes the place of the upper radial ones which are wanting. This form however is not constant, and transitions into the usual form are ~~found~~ on the same specimen.

244

3548

Central spine very bulbous at base, almost terete, black, often with a lighter tip, curved upwards, longer than the others, 1–2 inches long. —

Flower 2½–3½ inches long and wide, not fully open (before ~~the o'clock~~ noon) of a dark purple colour. Spines on lower part of tube 2½–4, on upper 3–8 l. long, distinctly bulbous at base and often angular; petals from 4 to 7 l. wide, of different shape, acute or obtusish; stamens very numerous (about 1600 in a specimen examined by Mr Wright), from the upper widened part of tube only, lower narrower part 3–4 l. long, naked. Style greenish white; stigmas 12–16, erect, green. — Fruit 1–1¼ inch long, purplish green, edible; seeds 0.7 l. long ~~much compressed~~ obliquely obovate with a more or less orbicular hilum; tubercules on seed confluent ~~so as to~~ and forming irregular pits, — so that the seed at first sight seems pitted like some Mamillaria seeds. —

Cereus Bigelovii seems to be nearly allied to this species, but is distinguished by the dense caespitose growth, the long and much curved radial spines, of which the lowest one is the shortest; But perhaps these characters are not sufficient ~~and~~ ~~we ought to arrange them~~

β? ~~Yuniensis~~

γ. mohavensis

~~β. purpurascens~~ γ. mohavensis

Subspecies Bigelovii var. ~~γ. Bigelovii~~ ~~see pg 236~~

δ. ? yuniensis

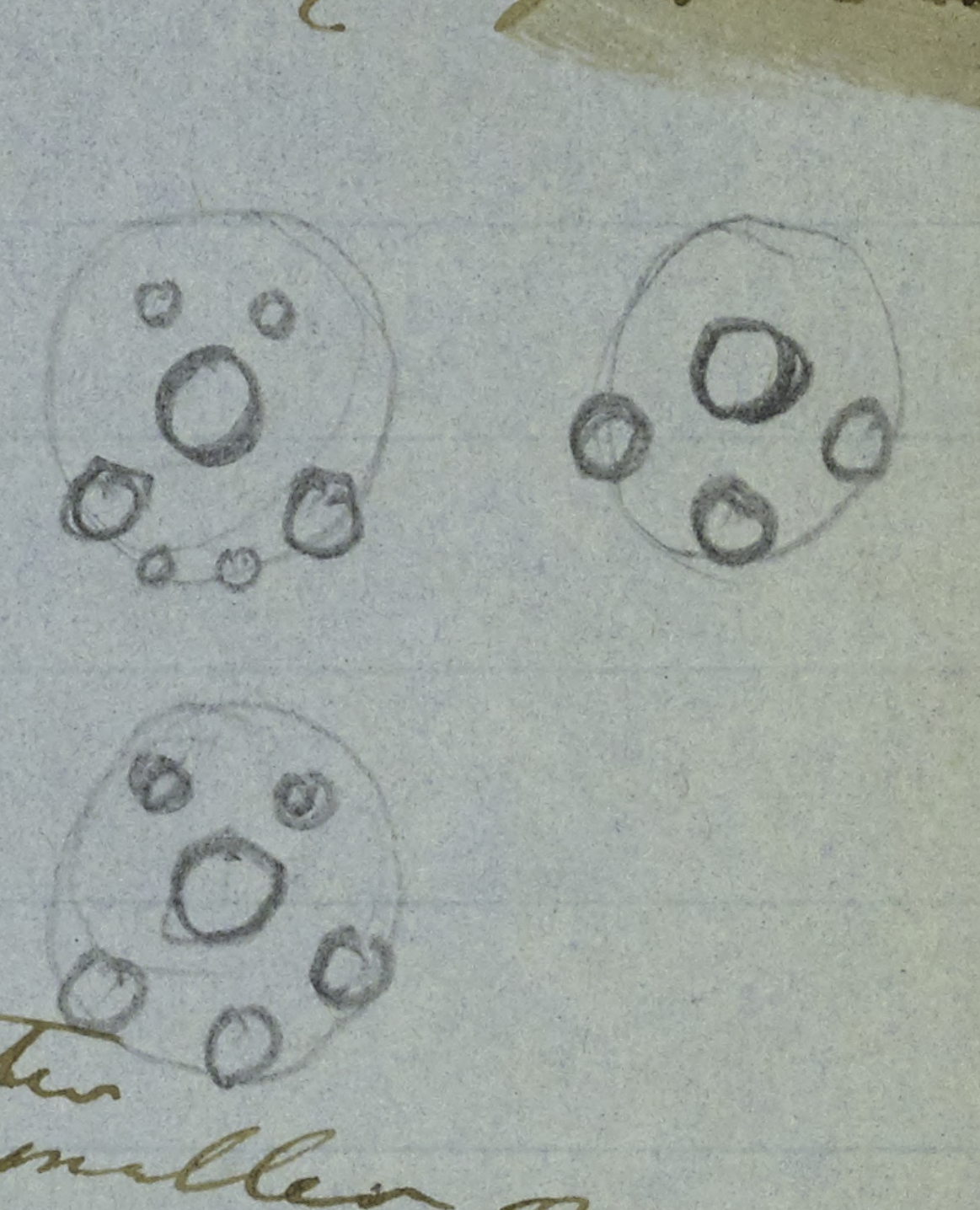
The dense caespitose growth of the ovate heads, the long radial spines the lowest of which is the shortest, while the central is hardly longer than the lateral spines seem to indicate that we have either two forms or 2 distinct species before us — but in the absence of flowers and fruit we are unable to draw satisfactory lines of distinction.

Today Sept 27th I begin the difficult Opuntiae for Dr Bigelow's publication!

Opuntia erinacea Engelm & Bigel.

diffusa adscendens, articulis ~~crassis~~ tumidis ovatis s. teretibus, areolis ~~pulvillis~~ confertissimis ovato-orbiculatis ~~junioribus~~ albotomentosis densissime ~~setis stramineis stipatis~~ stramineo-setosis, omnibus aculeiferis; aculeis 3-5 (cum adventitiis 2-4 minoribus) ~~[illegible]~~ gracilibus elongatis e cinereo rubellis 1-3 superioribus minoribus sursum porrectis centrali patulo vel declinato ceteris deflexis; flore —; bacca ovata profunde umbilicata, areolis ~~pulvillis~~ 30-40 ~~stramineo-setosis~~ setas stramineas et aculeos ~~spiculas~~ 12-20 gerentibus; seminibus magnis subregularibus, ~~carina acutiuscula~~ late-~~[illegible]~~ acuteque marginatis.

West of the great Colorado, near the Mojave Creek. — ~~Joints per 2-4~~ inches long, 1-1½ inches wide, and about 1 inch thick, sometimes elongated and almost cylindric, densely covered with the ~~Areola~~ large, white areolae (only 2-3 l. distant from one another) and the numerous reddish gray spines with red points bristling hedgehoglike (whence the specific name) in every direction. All the areolae are spiniferous, with lower ones though the spines are shorter. Spines 6-14 l. long with some smaller ones on some old joints some of them even 20 l. long very slender, flexible but stiff.

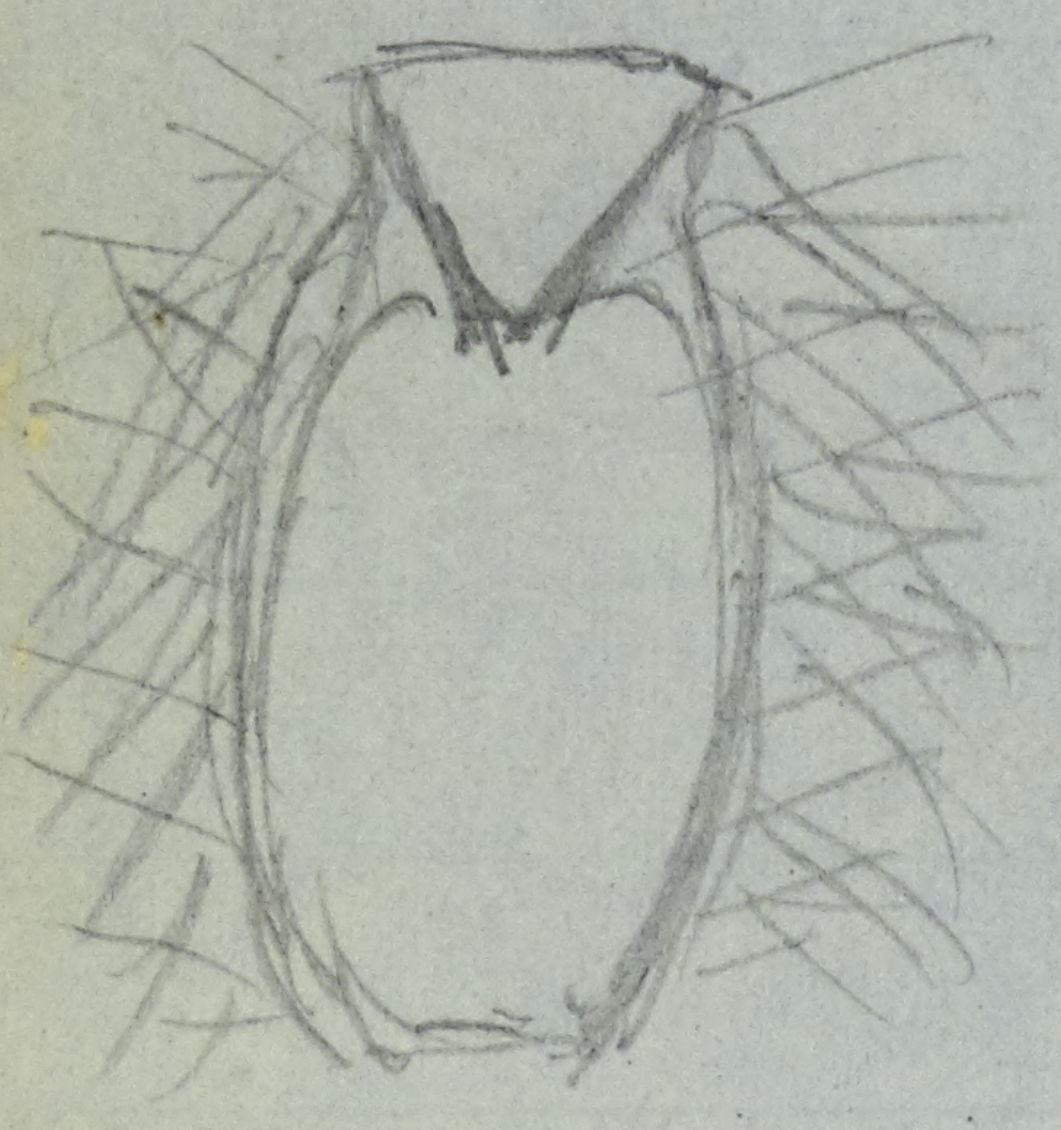


Young plants cylindric, each areola with 15-20 or more hairlike white radiating spines ^ ~~On~~ On a dead flower a sixparted stigma

bristles dirty yellow present even but short in young joints, — old ones ~~[illegible]~~ (numerous [illegible] densely crowded

and longer of 2-3½ l. long! Only [illegible]

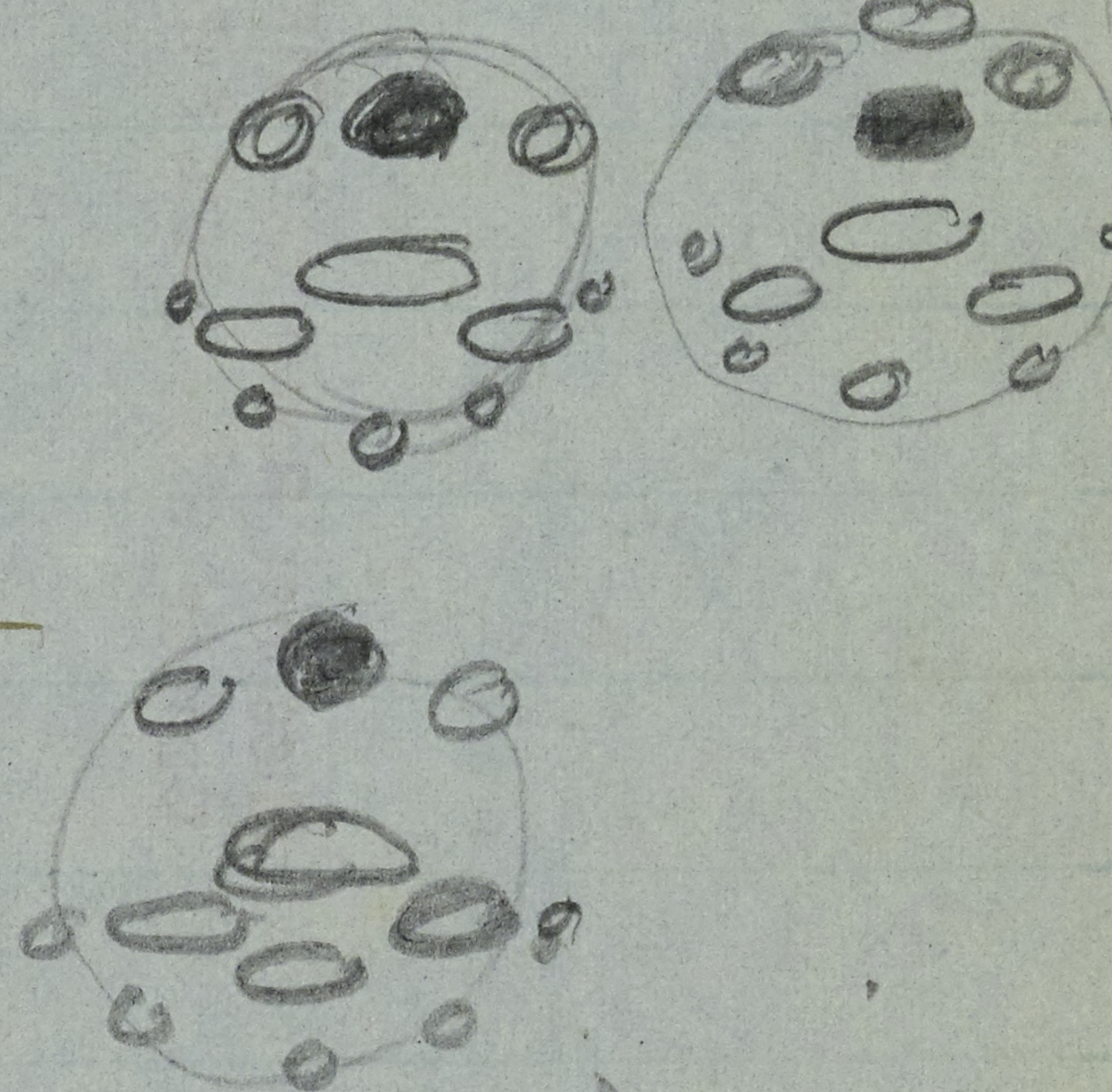
246 was noticed other parts of flower too much decayed to be distinguished. Fruit 1 - 1 1/4 inch long, ~~about~~ 1/2 inch in diameter, with deep conic umbilicus; ~~pulvilli~~ crowded, prominent white tomentose, with yellowish bristles and numerous mostly deflected spines, from 3 - 6 l. long. Seed much compressed, ~~nearly~~ 3 l. diameter rim rather ~~irregular~~ ~~regular~~, sharp & acutish. It may be observed here once for all, that the seeds of Opuntiae are never quite regular, from their being densely packed together, and that even among the most regular ones ~~many~~ some angular and twisted ones are frequently met with. The rim also is not the same on every side; just above the hilum it is mostly thickest and broadest, and below it, it is narrowest & sharpest.

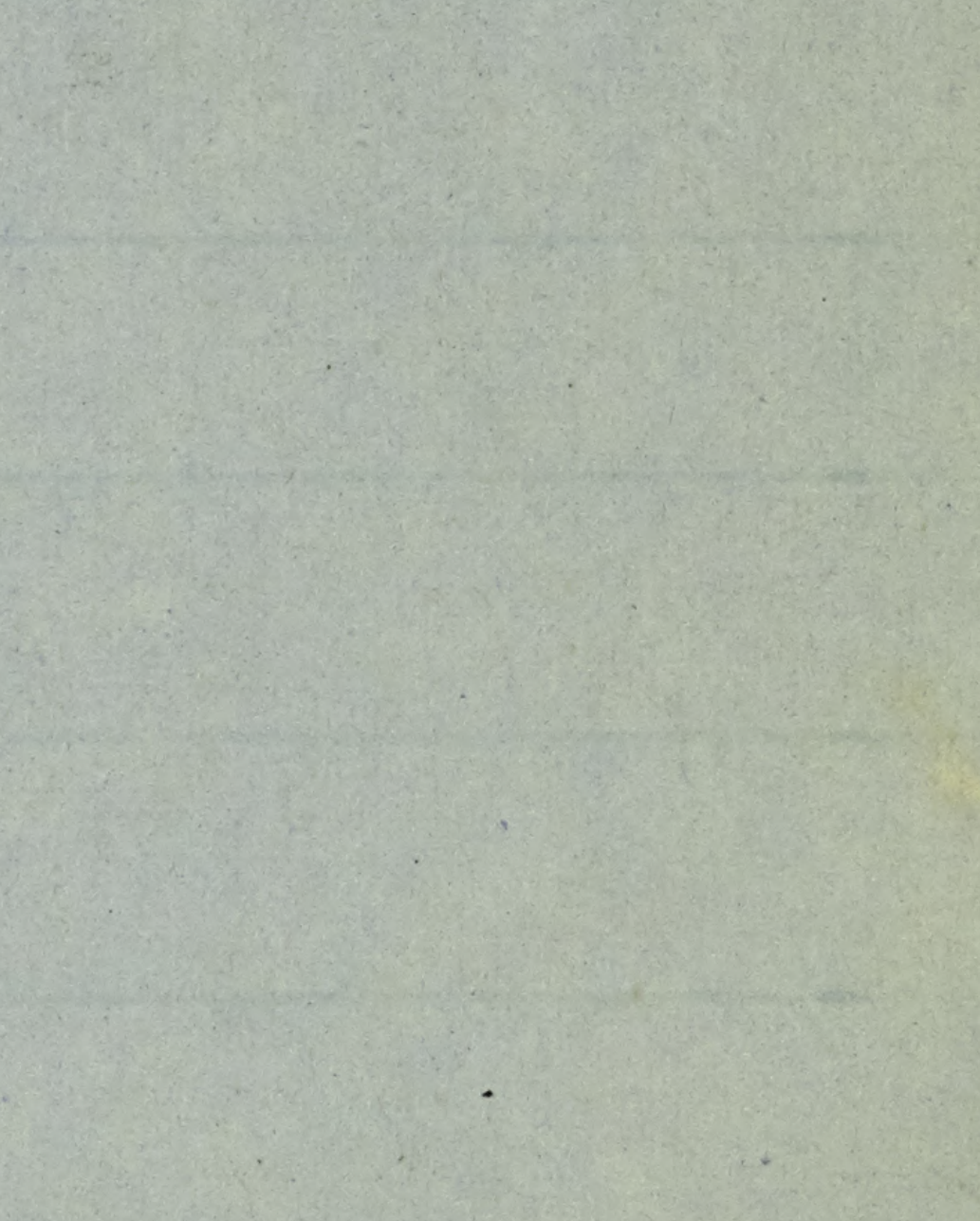


All the Op. ellipt known to me have a distinct often thick and wide rim, the Xerocarpeae broader than most others; the Cyl. Op have a very narrow rim, which in some is reduced to a single linear commissure, only in O frutescens & vaginata it is similar to the flatjointed Opuntiae.

Opuntia hystricina E&B. diffusa

articulis obovato-orbiculatis compressis,
areolis ~~sub approximatis~~ confertis orbiculatis magnis
~~breviter~~ griseo-tomentosis, setas pallidas
~~fuscasve~~ rutilasve gerentibus, omnibus
aculeiferis; aculeis 5-7 inferioribus (albidis
decorsum radiantibus) brevioribus tenuioribus
~~3-5 superioribus elongatis angulatis~~
~~saepe tortis, albidis deflexis + centralibus 1-3 subsingulo~~
~~longissimis infra fuscatis porrectis s.~~
~~patulis, s.~~
ceteris 5-8 elongatis angulatis
saepe tortis flexuosisque, inferioribus 3-4 deflexis albidis
~~centrali subsingulo longissimo infra fuscato~~
~~patulo s. sub deflexo, superioribus sub 3~~
~~suberectis~~
uno alterove longissimo, superioribus
2-4 patulis suberectisve,
saepe basi s. ad medium fuscatis.
flore —
Bacca obovata subclavata,
umbilico parum depresso,
areolis 25-30 inferioribus minoribus
inermibus, superioribus confertis
aculeos paucos gerentibus;
seminibus maximis, irregularibus,
late crasseque marginatis.





This beautiful species
was found abundant from the Rio Grande to the
San Francisco Mountains mixed
with O. missouriensis to which
it is nearly allied. The specimens
before us are from the Colorado Chiquito
and the San Francisco Mountains.
Joints in these specimens 3-4 inches
long and nearly as broad.

Areolae 5–6 l. distant. Lower radiating spines 4–9, the other 1½–3 and even 4 inches long, irregularly arranged as we generally find it in this genus; we notice ~~many~~ specimens where ~~the~~ 4 larger spines are placed above the lower short radiating ones, the upper one of these is usually the longest; ~~above~~ sometimes above these are 2 to 4 other spines, the lower one of which is ~~mostly~~ the darkest and often not much shorter than the one just mentioned, the others are shorter, and dark only at base or altogether whitish. — The bristles are ~~not very con~~ yellow in some & brown in other specimens; sometimes we find short pale and longer darker bristles together. — The fruit is 1 inch long and half as wide with a very shallow umbilicus; the upper larger areolae only bear 4–6 spines (2–5 l. l.), the lower ones on the contracted part of the fruit are very small and distant, spineless. Seed among the largest in this genus, 3½ l. in diam.; the thick & broad rim acutish. —

fl. St Louis

— Cer. Fendleri; El Paso Specimen 10 ribs 7 inches high

2 1/2" diameter at base 8 rad. spines, upper ones generally smaller sometimes orange and dark, lower radial ones generally largest; straight, central spine longest dark, curved upward. — fl. near the top — June 13th 15

Specimen coll. a year ago and just planted! —

fl. with ovary 3" long (ovary 9''') oval with 32 pulvilli in the axill of a very slender herbaceous bristle; spines of the areolae mostly 9, 3 to 5 l. long white — 5 lowest sepals of the tube triangular, scaly with (pulvilli ~~lanceolate~~ spinigerous, 5-7 ~~bristly~~ spines), 13 larger linear acute, mucronate sepals & petals 21 purple (purple with green midrib) linear lanceolate, mucronate, margin ~~slightly~~ mucronate 3-4''' wide 18-20''' long; stamen bearing part of tube 6-7''' long; fil. yellow 5-6''' long; style pale yellow (with stig. 18''' long); stigma tuberculate, 12 green, obtuse 4''' long, exsert above the stamens

3550

Mr J. Halsall

Dear Sir

Please deliver to

Dr King the

Opuntia ~~polytricha~~ trichophora E & B diffusa radice fibrosa
articulis ovatis compressis, areolis confertis
parce albo-tomentosis setas stramineas demum albidas
breves gerentibus, omnibus aculeiferis aculeis 10-18 setoformibus albis
~~10-12 (brevioribus) (inferioribus lateralibusque radiantibus~~
3-6 superioribus ~~longioribus~~ deflexis singulo ~~centrali declinato~~
~~patente s. superioribus~~ exterioribus 8-12 brevioribus
radiantibus, interioribus ~~longioribus~~ deflexis
raris singulo erecto-patente; ## —
bacca ovata (umbilico parum depresso) areolis 35-40 confertis albotomentosis ~~spinis~~
stramineosetosis, fasciculum ~~aculeorum~~ 12-18
plerumque deflexorum gerentibus
seminibus maximis irregularibus
valde compressis, latissime acuteque
marginatis

(## (articulis vetustioribus lignosi) areolis in
confertissimis, aculeosque setas ~~numerosas~~ ~~longe~~ 15-25 capillaceos elongatos
(canam caprinam simulantes) flexuosos
gerentibus ~~stipitatis~~

Only found on the volcanic Rocks
about Santa Fe and on the Sandia Mountains
near Albuquerque. The hoary appearance
of the older joints ~~is~~ very characteristic
and reminds one of Pilocereus senilis;
These hairs are from a few lines to
2 or 2½ inches in length and ~~about~~ of the appearance and
as fine as ~~human~~ the hairs of an old mans beard,
~~The old joints become~~ thick and
ligneous. ~~almost~~ ~~Younger~~ joints
about 4½ inches long by 2½ wide, or larger,
areolae ~~4~~ 5 l. distant; exterior spines
3-6 l. long radiating, mostly downward,
a few on the upper margin of the areola
obliquely upwards, interior spines 9-18 l. long.
Fruit ovate, 10 l. long, 7 in diameter
covered with very slender spines ~~3~~ 6 l. long, mostly reflexed
Seeds with those of O. hystricina the largest

Known to me; 2½ l. in diameter and sometimes even more, of much compressed and with a very broad and acutish rim almost of the thickness of the seed itself.

Opuntia missouriensis

diffusa, prostrata radice fibrosa articulis obovatis suborbiculatis ve compressis ~~laete~~ viridibus) + foliis (parvulis subulatis patentibus), areolis (sub approximatis ~~convexis~~ (in tuberculis convexis) ~~albido~~ tomentosis albido s. griseo ~~demum griseo~~, ~~setas stramineas omnibusque aculeos gerentibus~~ stramineo-setosis ~~omnibusque~~ ~~superioribus~~ aculeos paucos breves debiles solum, superioribus plures robustioresque ~~que~~ gerentibus; aculeis ~~(in areolis superioribus)~~ ~~[illegible]~~ 5-10 exterioribus minoribus radiantibus, albidis ~~inferioribus~~ inferioribus tenuioribus, superioribus si adsunt paulo robustioribus divergentibus; aculeis interioribus (in areolis superioribus) 1-3 robustis longioribus patulis ~~s. saepius erectis~~, albidis s. rufescentibus; floribus ovario obovato-subgloboso ~~sepalis~~ areolis 25-35 ~~albido~~ tomentosis aculeiferis stipato; sepalis ~~sub~~ 13 exterioribus oblanceolatis interioribus obovatis cuspidatis petaloideo-marginatis, petalis sub 13 (orbiculato obovatis) obtusis, obcordatis, crenulato erosis saepe herbaceo mucronulatis; stigmate ~~obtuso sub 8~~ globoso subrotundo, sub-8 partito viridi; bacca ovata s. rarius subglobosa

251

~~plano~~ infundibuliformi ~~, superne~~
umbilico ~~parum depresso~~ ; areolis
25–35 albotomentosis setas
(albidas ~~st~~ stramineas v. rufescentes)
aculeosque numerosos gerentibus;
seminibus magnis, irregularibus,
late ~~ro~~ obtusanguleque marginatis.

rutila

This variable plant extends
from ~~the country~~ north of the Missouri River 48°–35°
to the region south of the Canadian River
and from long. 99°, ~~East~~ West of Fort Pierre on
the Missouri to 112 on the San Francisco
Mountains #); It has not been seen
along the Rio Grande further south
~~th~~ ~~the~~ Sandia Mountains. Fl. May fr.
ripe the same fall

# (I was under the impression the
Op. miss. was a plant of the higher
western plains and the foot of
the Rocky Mountains scarcely reaching
the mountains themselves and the
Rio Grande, but Dr Bigelow informs
me that he has seen it ~~frequently~~ common
from Santa Fe westward to the
San Francisco Mountains. Whether the
plant extends westward ~~in the~~ over the mountains
in higher latitude is unknown.
It is not mentioned among the
plants of the Salt Lake country
~~Might~~ Nuttall's O. rutila "with strong spines on fruit
& joints" from
the upper waters of the great Colorado
~~Color~~ be a red flowering var. of this plant,
or is it rather one of the cylindric
Opuntias of the western territory,
perhaps ~~O. ar~~ O. acanthocarpa?
but in this case Nuttall would
not have failed to notice the cylindric stem.

note

Nuttall was the first to ~~dis~~ discover it
on the upper Missouri in the year 1811
he described it by the name of Cactus ferox

3551

and ~~[illegible]~~ noticed 8–10 greenish stigmata" and the dry "& spiny fruit". The deep "purple fruit as large as a hen's egg" mentioned after Dr James by Torrey & Gray perhaps belongs to our O. camanchica. They are certainly foreign to O. Miss.

O. Missouriensis forms large spreading masses, much dreaded by the travellers of the western plains. The joints in our specimens are mostly suborbicular, 2–4 inches long and 2–3½ wide, ~~[illegible]~~ light green, somewhat tuberculated in semi-spherical elevations bearing the areolae; ~~which are~~, Areolae 4–6 lines apart; with numerous ~~radiating~~ white spines radiating downward and sideways, sometimes ~~rarely~~ a few obliquely upwards, 2–6 l. long, mostly more elongated; Central spines in the Missouri specimens mostly one, rarely 2, in the southern specimens often 2–4, 1–1½ inches long, in very robust specimens even 2 inches long; Spines mostly ~~rarely deficient on the~~ smaller ~~smaller~~ (on the lower areolae), ~~rarely~~ & central ones wanting ~~wanting on central ones rarely~~ ~~or few central spines only present~~. In some specimens from the Missouri ~~I~~ I find ~~few and first~~ weak spines ~~on~~ on the upper and none at all on the lower areolae; in others from the same region all the areolae are ~~nearly~~ equally armed with 5 weaker (2 & 3 l.) lower ~~radiating~~ and 5 ~~inner~~ stouter ~~radiating spines~~ spines, spreading in all directions

(nearly twice as long as the areolae)
Leaves small and slender 1½–2 l. long and at the base hardly more than ½ l. in diameter, smaller

terete or sometimes somewhat angular white, or mostly with reddish base when young or entirely brown-red with lighter tips.

deflexed
nearly equal (4–6 lines)

Cact 64

Sept 1855

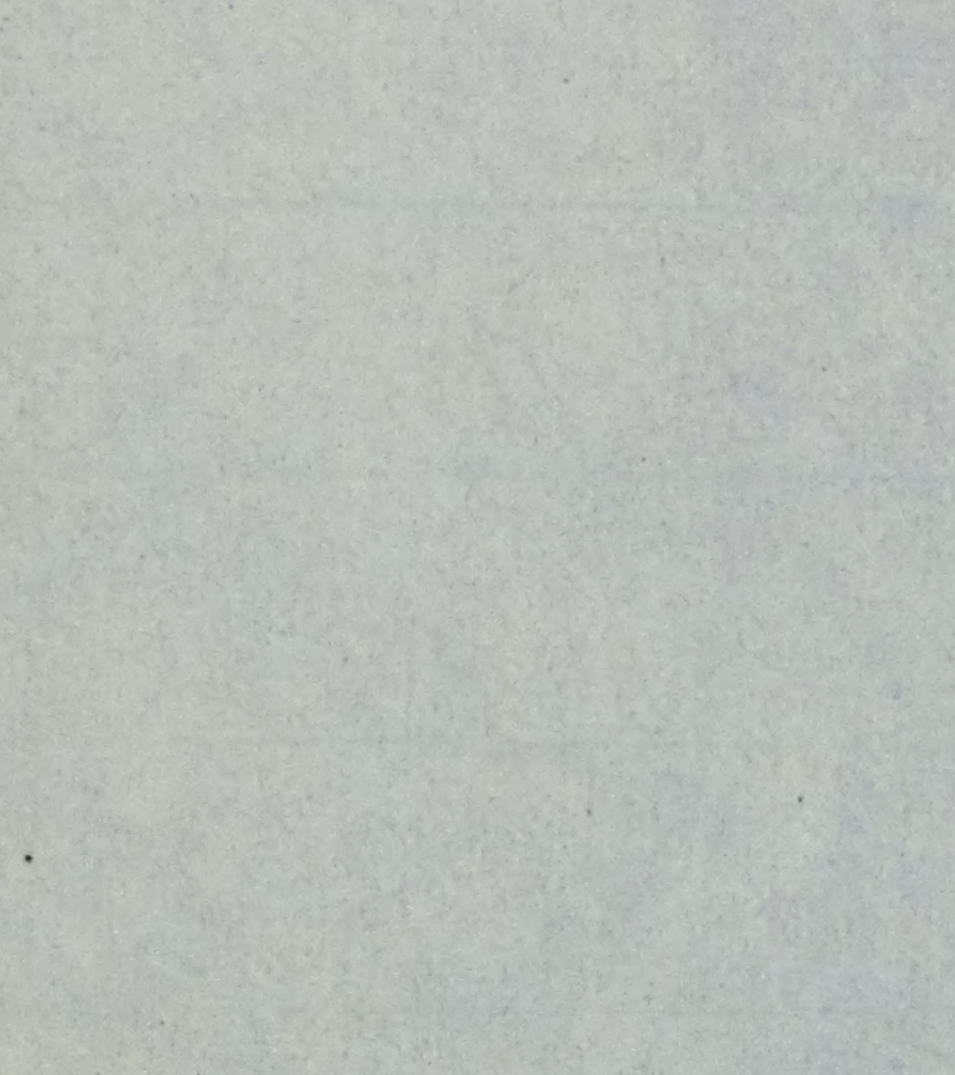
Flowers 2–3 inches in diameter ovary covered with ~~the~~ subulate sepals in every respect resembling the leaves, spines already present, but not as long and stiff as on the fruit. Petals yellow, ~~with a~~ rose coloured, ~~or~~ orange inside towards base; the ~~orange~~ red colour sometimes invades the greater part of the petal, leaving only the margin yellowish, exterior ~~filaments~~ much the longest deep red, interior ones paler, shorter; ~~pistils~~ pale yellowish thickened below the middle, stigmata united into a small globose subconic head.

Fruit ovate or in some forms globose; umbilicus shallow, spines on the areolae numerous (6–12) but ~~mostly~~ usually short (1–4 or rarely 6 l. long) Seeds, rather large, ~~about 3 l.~~ diameter, rarely smaller, or larger, irregular, twisted & angular, much compressed, ~~and~~ with a broad & thick, but rather acutish rim. Embryo of different shapes according to the shape of the seed, but always with a small album, ~~and with a~~

I shall proceed to mention several ~~numerous~~ forms, which I do not hesitate to include in this species though the whole history of every one is not known yet.

γ. subinermis: articulis elongato obovatis, areolis remotioribus inermibus s. aculeolis: paucis: brevibus ~~armatis~~ generatim bus.

A specimen brought from the upper Missouri, neighborhood of Fort Pierre by Dr Hayden, has been cultivated by me for two years now and retains the singular appearance described above. Leaves entirely similar to those of the common form. Joints 3½–5 inches long, half as wide, gradually narrowed at base. Spines entirely wanting, or 2 or 3 short and slender ones, rarely one or the other more robust, ½ inch long. — Has not yet flowered.



α. rufispina articulis orbiculatis s. transversis; areolis setas parvas rufescentes gerentibus; aculeis [illegible] radialibus 6–8 albidis rufo-variegatis, interioribus 2–4 robustis fuscis, apice pallidioribus deflexis, singulo robustissimo patente; bacca ovata.

This is the stoutest form of this species*, ~~collected on~~ rocky places on the Pecos; found also on the Yellowstone and no doubt in all the intervening territory. Joints in the Pecos specimen 2–3 inches high and 2½–3 wide, areolae 4–5 l. distant, bristles few but ~~stouter~~ longer and darker than in the other forms; stouter patent spines 1¼–2 inches long. Fruit 1 inch long with shallow umbilicus, about 30 the upper areolae with 6–10 slender spines 2–6 l. long*; seed 2½–3 l. diameter very irregular, with broad and sharp rim

* and greatly deserves Nuttall's original name: *ferox*

* the lower ones often almost naked in other specimens the spines are hardly 3 l. long.

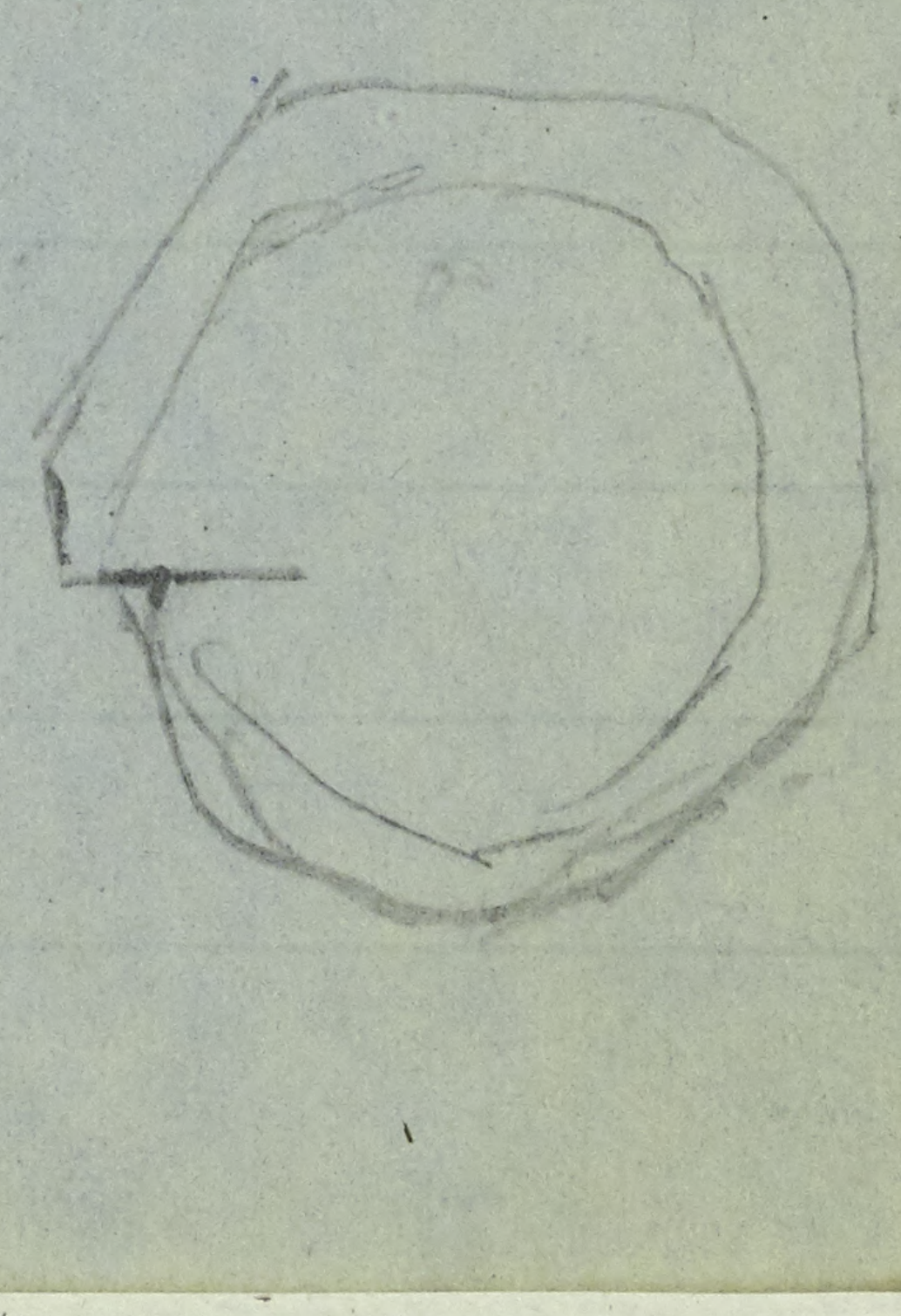
var. β albispina articulis late obovatis areolis ~~[illegible]~~, setas stramineas gerentibus, aculeis omnibus albis, ~~exterioribus~~ 6–10 setaceis, interioribus in areolis superioribus ~~magnioribus~~ solummodo extantibus 1–3 robustis elongatis deflexis s. patulis; bacca ovata sem. magnis

Sandy bottoms and arroyos on the Canadian ~~[illegible]~~; Sandia Mts near Albuquerque? found also on the Missouri, ~~[illegible]~~ the easternmost locality of the species in this latitude, abt 250 miles east of the Pecos. —

Joints larger & more oval than in the first form, 3–4 inches long and 2½–3 wide areolae rather more distant, (4–6 l.) spines all ivory white, rarely with a yellowish tinge; larger ones 1¼ inches long. Fruit with very shallow umbilicus and very slender & short spines. Seed 3–3½ l. in diameter irregular, rim broader somewhat obtuse. A specimen from the Sandia Mountains near Albuquerque has more distant areolae, and longer more slender spines, some of which are flexuous; it may be a form of O. polytricha or form a transition to it.

δ. platycarpa articulis obovato-orbiculatis areolis setas stramineas purpureas gerentibus, ~~aculeis~~ aculeis exterioribus 5–10 inferioribus albidis, superioribus robustioribus rufescentibus, centrali subsingulo robusto fusco patulo s. deflexo, bacca depresso-globosa, umbilico lato plano; areolis sub 25, aculeis 5–10 breves gerentibus.

On the Yellowstone River coll by Dr Hayden 1851. — One of the stouter forms of this species ~~with stout brown spines.~~ Joints about 3 inches long by 2½–2¾ wide



Areolae 4–6 l. apart, yellowish dirty bristles visible only on older joints; ~~Central~~ spines single, or only in vigorous specimens on the upper areolae 2 lower ones whitish or light yellowish brown, upper ones mostly deep redbrown, with lighter tips. — Fruit of a remarkable form, depressed globose, with a very broad and perfectly flat umbilicus; 8–9 lines high, umbilicus of the same diameter. Areolae with large white woolly ~~short~~ deflexed spines ~~of~~ ~~1~~ 2 l. long. Seed about 3 l. in diameter, irregular, rim rather narrower than in the N. Mexican species, obliquely

Sub spec

E.? sphaerocarpa articulis orbiculatis transversis ve, areolis inferioribus inermibus, superioribus aculeis robustioribus rufos 1–3 patentes s. deflexos, ~~et~~ breviores perpaucos (1–3) s. nullos gerentibus; bacca globosa, umbilico plano areolis sub 25 ~~setosis~~ tomentosis vix aculeatis; seminibus minoribus, acute marginatis.

On the eastern declivity of the Sandia Mountains near Albuquerque. Joints in the specimen before us about 3 inches wide and a little less long; lower areolae without spines, those on or near the upper edge armed with a few ~~stout~~ radial deflexed spines and 1–3 stouter ones, 3/4–1 inch long; sometimes the smaller radiating spines are wanting. — Fruit globose, 9 lines in diameter, umbilicus 5–6 lines in diameter, areolae bristly, but without or only the upper ones with ~~one~~ or a few small spines

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